ICD 08240

Amateur Radio

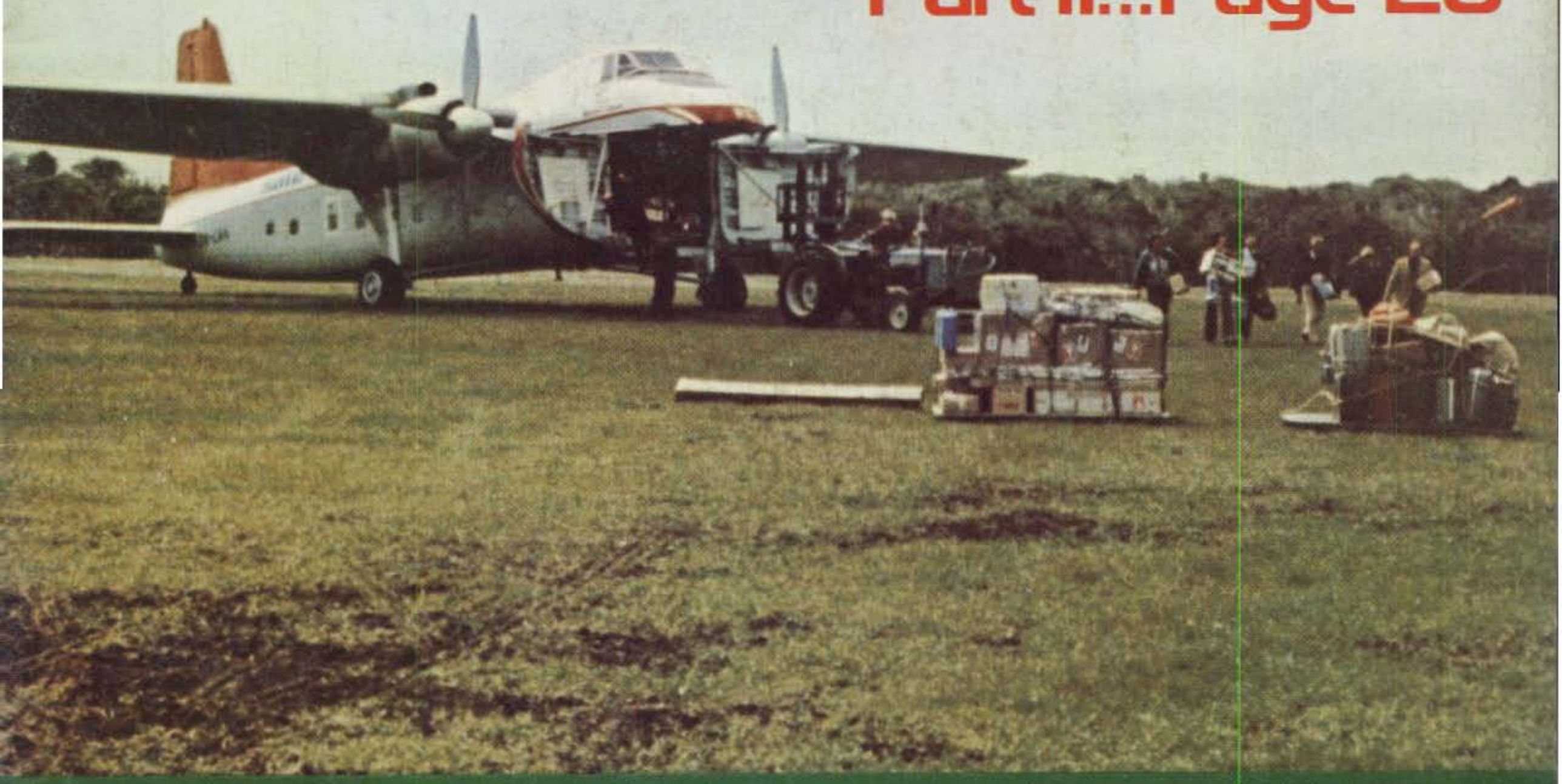
CQ

SERVING AMATEUR RADIO SINCE 1945

Including: modern electronics

NOVEMBER 1979 $2.00

Airlifting A DXpedition In The Pacific Chatam Island, ZL3/C Part II...Page 28



QRP On 1750 Meters...Page 35

A Two-Band V.F.O. For 80 And 40 Meters...Page 51

THE RADIO AMATEUR'S JOURNAL

0 74820 08240 11

FM 25W

143.800 — 148.200 MHz Mobile Transceiver

Power to the mobile operators! This one is brand new, and it carries a powerhouse punch wherever you're going. ICOM unveils a full 25 watts of mobile power with the introduction of the new **IC-255A.** When you want increased mobile QSO range, ICOM delivers; and **nobody does it better**.

The microprocessor controlled **IC-255A** is a deceivingly compact unit which packs more big, multifeature flexibility than any other ICOM mobile to date. This one offers a 5 channel memory, complete with memory scan, adjustable scanning speed, and auto-stop. The 5 channels can easily be written from any inband frequencies; and the scan function can be programmed to scan all 5 or only 2, stopping on any signal.

Like the other new ICOM transceivers, the IC-255A comes with 2 VFO's built-in at no extra cost. The radio is programmed to come up to power operating at 600Khz splits, but it can be reprogrammed to any split of your choice. The dual VFO's and single tuning knob provide you with smooth, easy tuning in 15KHz or 5KHz steps.

The use of new low-noise, dynamic range junction FET's (for the RF amplifier and the first mixer) and helical cavity filters (for the antenna and RF circuits) provides excellent sensitivity and intermodulation distortion characteristics. A pair of high quality monolithic crystal filters and ceramic filters facilitates interference free reception reliability.

The new **IC-255A's** power is selectable 25W high or 1W low, yet it draws only 5.5 amps when transmitting in the high power mode. A directly amplified VCO output, without the use of multipliers or mixers, and a power module in the PA unit produce a very clean transmitted signal, with low spurious radiation. When you're in an RF trap, the **IC-255A** can get out the signal. To give your mobile FM operations big features with a power punch, give yourself the **IC-255A.**

Specifications subject to change without notice. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. © 1979, ICOM East, Inc.

HF/VHF/UHF AMATEUR AND MARINE COMMUNICATION EQUIPMENT

ICOM

ICOM WEST, INC.
Suite 3
13256 Northrup Way
Bellevue, Wash. 98005
(206) 747-9020

ICOM EAST, INC.
Suite 307
3331 Towerwood Drive
Dallas, Texas 75234
(214) 620-2780

ICOM CANADA
7087 Victoria Drive
Vancouver B.C. V5P 3Y9
Canada
(604) 321-1833

Phone numbers for parts orders: **ICOM West, Inc.,** (206) 747-9020; **ICOM East, Inc.,** (800) 527-7425 (orders only), Texas Residents call (214) 620-2780.

ICOM INFORMATION SERVICE
3331 Towerwood Dr., Suite 304 Q
Dallas, Texas 75234

Please send me: ☐ IC-255A specifications sheet; ☐ full color ICOM Product Line Catalog; ☐ List of Authorized ICOM Dealers.

NAME _____ CALL _____

ADDRESS _____

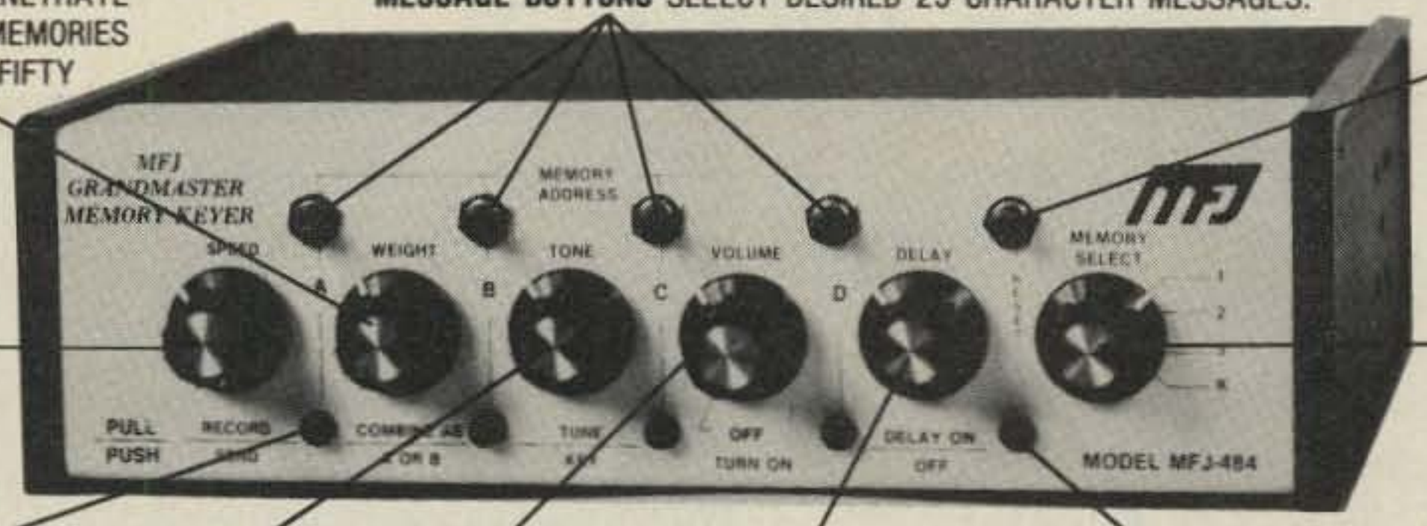
CITY _____ STATE _____ ZIP _____

You may send a machine copy of this form

NEW! MFJ INTRODUCES THE *GRANDMASTER* MEMORY KEYERS

At $139.95 this MFJ-484 GRANDMASTER

memory keyer gives you more features per dollar than any other memory keyer available — and Here's Why . . .



WEIGHT CONTROL TO PENETRATE ORM. **PULL** TO COMBINE MEMORIES A AND B FOR 1, 2, OR 3 FIFTY CHARACTER MESSAGES.

MESSAGE BUTTONS SELECT DESIRED 25 CHARACTER MESSAGES.

RESETS MEMORY IN USE TO BEGINNING.

SPEED CONTROL, 8 TO 50 WPM. **PULL** TO RECORD.

MEMORY SELECT: POSITIONS 1, 2, 3 ARE EACH SPLIT INTO MEMORY SECTIONS A, B, C, D (UP TO TWELVE 25 CHARACTER MESSAGES). SWITCH COMBINES A AND B. **POSITION K** GIVES YOU 100, 75, 50, OR 25 CHARACTERS BY PRESSING BUTTONS A, B, C, OR D.

LEDs (4) SHOW WHICH MEMORY IS IN USE AND WHEN IT ENDS.

TONE CONTROL. PULL TO TUNE.

VOLUME CONTROL. POWER ON-OFF.

DELAY REPEAT CONTROL (0 TO 2 MINUTES). **PULL** FOR AUTO REPEAT.

LED INDICATES DELAY REPEAT MODE.

NOW YOU CAN CALL CQ, SEND YOUR QTH, NAME, ETC., ALL AUTOMATICALLY.

And only MFJ offers you the MFJ-484 Grandmaster memory keyer with this much flexability at this price.

Up to twelve 25 character messages plus a 100, 75, 50, or 25 character message (4096 bits total).

A switch combines 25 character messages for up to three 50 character messages.

To record, pull out the speed control, touch a message button and send. **To playback,** push in the speed control, select your message and touch the button. That's all there is to it!

You can repeat any message continuously and even leave a pause between repeats (up to 2 minutes). **Example:** Call CQ. Pause. Listen. If no answer, it repeats CQ again. To answer simply start sending. LED indicates Delay Repeat Mode.

Instantly insert or make changes in any playing message by simply sending. Continue by touching another button.

Memory resets to beginning with button, or by tapping paddle when playing. Touching message button restarts message.

LEDs show which 25 character memory is in use and when it ends.

Built-in memory saver. Uses 9 volt battery, no drain when power is on. Saves messages in memory when power loss occurs or when transporting keyer. Ultra compact, 8x2x6 inches.

PLUS A MFJ DELUXE FULL FEATURE KEYER.

Iambic operation with squeeze key. Dot-dash insertion.

Dot-dash memories, self-completing dots and dashes, jamproof spacing, instant start (except when recording).

All controls are on front panel: speed, weight, tone, volume. Smooth linear speed control. 8 to 50 WPM.

Weight control lets you adjust dot-dash-space ratio; makes your signal distinctive to penetrate QRM.

Tone control. Room filling volume. Built-in speaker.

Tune function keys transmitter for tuning.

Ultra reliable solid state keying: grid block, cathode, solid state transmitters (−300 V, 10 ma. max., +300 V, 100 ma. max.). CMOS ICs, MOS memories. Use 110 VAC or 12 to 15 VDC. Automatically switches to external batteries when AC power is lost.

OPTIONAL SQUEEZE KEY

for all memory keyers. Dot and dash paddles have fully adjustable tension and spacing for the exact "feel" you like. Heavy base with non-slip rubber feet eliminates "walking". $29.95 plus $2.00 for shipping and handling.

THIS MFJ-482 FEATURES FOUR 25 OR A 50 AND TWO 25 CHARACTER MESSAGES.

- **Speed, volume, weight, tone controls**
- **Combine memory switch**
- **Repeat, tune functions**
- **Built-in memory saver**

$99.95

Similar to MFJ-484 but with 1024 bits of memory, less delay repeat, single memory operating LED. Weight and tone controls adjustable from rear panel. 6x2x6 inches. 110 VAC or 12 to 15 VDC.

THIS MFJ-481 GIVES YOU TWO 50 CHARACTER MESSAGES.

- **Repeat function**
- **Tune function**
- **Built-in memory saver**

$79.95

Similar to MFJ-482 but with two 50 character messages, less weight controls. Internal tone control. Volume control is adjustable from rear panel. 5x2x6 inches. 110 VAC or 12 to 15 VDC.

For Orders Call toll-free 800-647-1800

Order any product from MFJ and try it. If not delighted, return within 30 days for a prompt refund (less shipping).

Order today. Money back if not delighted. One year unconditional guarantee. Add $2.00 shipping/handling.

For technical information, order/repair status, in Mississippi, outside continental USA, call 601-323-5869.

Order By Mail or Call TOLL FREE 800-647-1800 and Charge It On VISA master charge

MFJ ENTERPRISES, INC.

P. O. BOX 494
MISSISSIPPI STATE, MISSISSIPPI 39762

CIRCLE 35 ON READER SERVICE CARD

FREE PHONE! 800 854-6046

CALIF. CUSTOMERS PLEASE CALL OR VISIT STORES LISTED BELOW

PLUS FREE SHIPMENT U.P.S. (Brown).

(Except where otherwise noted)

SERVING HAMS *BETTER!*

North ... south ... east ... west

All leading brands
in-depth stocks
new/used gear

Bob Ferrero, W6RJ/K6AHV, Jim Rafferty, N6RJ
other well known hams give you courteous, personalized service

NEW KENWOOD TS-180S/DFC

Special deal!

① SEND US $1149.95

② WE'LL SEND YOU A TS-180S/DFC PLUS YOUR CHOICE OF ANY ONE OF THE FOLLOWING:

Ⓐ PS-30,30A SUPPLY. $139.00 value.

Ⓑ BIRD "43" WATTMETER. $125.00 value.

Ⓒ YK-88SSB I-F FILTER plus 500 Hz CW FILTER (2). $119.90 value.

FREE SHIPMENT ALL ABOVE ITEMS (UPS Brown).

TS-180S/DFC, superlative new HF transceiver for DXers, contesters, discerning amateurs who want top performance, 160 through 10M (also ±50kHz above, below bands).

- Digital freq. control (DFC) • Four memories (usable in transmit and/or receive modes) and manual scan.
- All solid state including final • No dipping or loading, just dial up, peak the drive, operate.
- High power. 200W p.e.p./160W DC input, 160-15M, 160W p.e.p./140W DC input, 10 meters.
- Digital frequency readout • SSB, CW, FSK • Dual RIT (VFO or memory/fix) • Single conversion • Improved dynamic range • RF AGC prevents strong signal overload.
- Speech processor • 13.8VDC operation.

KENWOOD TS-520 SE *new*

ECONOMICAL VERSION OF THE POPULAR TS-520S

Regular price $629.95

(Less digital readout)

- 200W p.e.p. input SSB, 160W DC on CW.
- 160 through all of 10 meters • Noise blanker.
- RIT • 8 pole xtl filter • 25kHz calibrator.
- VOX/PTT/MANUAL operation
- Speech processor • 20db RF attenuator.
- CW Wide/Narrow bandwidth sw. For use with the optional CW-520, 500Hz CW filter.
- TUNE position for LP tuneup.
- Built-in speaker

ASK FOR SPECIAL INTRO-DUCTORY PRICE

KENWOOD

TR-7625

CDE ROTORS

T2X

HD-73 $109.95

ALLIANCE ROTATORS

U-100 $39.95

CALL FOR PRICES

TS-120S

HAM IV

OVER THE COUNTER (Mon. thru Sat. 10 AM to 5:30 PM) MAIL ORDER, Phone, Write.

ANAHEIM, CA 92801
2620 W. La Palma
(714) 761-3033 (213) 860-2040
1 mile east Knotts Berry Farm

SAN DIEGO, CA 92123
5375 Kearny Villa Road (714) 560-4900
Highway 163 & Clairemont Mesa Blvd.

OAKLAND, CA 94609
2811 Telegraph Ave. (415) 451-5757
Hwy 24 Downtown. Left 27th off-ramp.

BURLINGAME, CA 94010
999 Howard Avenue (415) 342-5757
5 miles south on 101 from S.F. Airport

VAN NUYS, CA 91401
6265 Sepulveda Blvd. (213) 988-2212
San Diego Fwy at Victory Blvd.

HAM RADIO OUTLET™

VISA master charge

• ALDA • ALLIANCE • ALPHA • AMECO • ATLAS • BIRD • CDE • COLLINS • CUSHCRAFT • CURTIS • DENTRON • DRAKE • EIMAC • HUSTLER • HY-GAIN • ICOM • KENWOOD • KLM • MFJ • MOSLEY • PALOMAR • ROHN • ROBOT • SHURE • SWAN • TELEX • TEMPO • TEN-TEC • TRISTAO • TELREX • TRI-EX • WILSON • YAESU • more.

Prices/specs subject to change without notice Calif. residents add sales tax.

Please send all reader inquiries directly

NOVEMBER, 1979 VOL. 35, NO. 11

The Radio Amateur's Journal

EDITORIAL STAFF

Alan M. Dorhoffer, K2EEK
Editor
Irwin Schwartz, K2VG
Managing Editor
Kim Smith
Assistant Editor
Chris Kelly
Editorial Assistant

CONTRIBUTING STAFF

Frank Anzalone, W1WY
Contest Chairman
John Attaway, K4IIF
DX Editor
Larry Brockman, N6AR
Robert Cox, K3EST
W.W. Contest Directors
Theodore J. Cohen, N4XX
Washington Commentary
William DeWitt, W2DD
SSTV Editor
A. Edward Hopper, W2GT
USA-CA Director
Robert Huntington, K6XP
WPX Award Manager
George Jacobs, W3ASK
Propagation Editor
Donald McClenon, N4IN
160 M. Contest Director
Irwin Math, WA2NDM
Math's Notes
William Orr, W6SAI
Antennas
Hugh R. Paul, W6POK
Technical Evaluations
Adrian Weiss, K8EEG/Ø
QRPp Editor
Bernie Welch, W8IMZ
WPX Contest Director
Bill Welsh, W6DDB
Novice Editor

BUSINESS STAFF

Richard A. Cowan, WA2LRO
Publisher/Advertising Sales
Richard A. Ross, K2MGA
Assoc. Publisher
Jack M. Gutzeit, W2LZX
Advertising Sales Manager
Eileen Lucey
Advertising Assistant
Janet T. Kurtz
Circulation Manager

PRODUCTION STAFF

Kim Smith
Production Manager
Chris Kelly
Production Assistant
William H. Travis
Art Director
Liz Ryan
Assistant Art Director
Karen Jensen
Designer
Hal Keith
Illustrations

CORPORATE OFFICERS

Richard A. Cowan
Chairman of the Board & President
Cary L. Cowan
Vice President
Jack N. Schneider
Vice President of Marketing
Richard A. Ross
Vice President & General Manager
Marc L. Gilman
Credit Manager
Amy Gilman
Secretary/Treasurer
Sanford R. Cowan
Founder & President Emeritus

Offices: 14 Vanderventer Ave., Port Washington, L.I., N.Y. 11050. Telephone: 516-883-6200. CQ (ISSN 0007-893X) is published monthly by Cowan Publishing Corp. Second Class Postage paid at Port Washington, N.Y. and other points. Subscription prices: one year $14.00, two years $25.00. **Entire contents copyrighted Cowan Publishing Corp. 1979. CQ does not assume responsibility for unsolicited manuscripts.** **Allow six weeks for change of address. Printed in the United States of America.**
Postmaster: Please send form 3579 to CQ Magazine, 14 Vanderventer Ave., Port Washington, L.I., N.Y. 11050.

FEATURES

A MESSAGE FROM THE PUBLISHER
Richard A. Cowan, WA2LRO 22

CQ SHOWCASE 24

THAT CHATHAM GANG, ZL3/C, PART II – CONCLUSION
Jan Gould, WA6YQW 28

QRP ON 1750 METERS *Pete Bradley, N1ADX* 35

DATELINE . . . WASHINGTON D.C.: THE INS AND OUTS OF THE WASHINGTON SCENE *Theodore J. Cohen, N4XX* 39

A CASSETTE FILE DIRECTORY PROGRAM FOR THE TRS-80 LEVEL I MICROCOMPUTER *Terry Kepner* 46

A TWO-BAND V.F.O. FOR 80 AND 40 METERS
Adrian Weiss, K8EEG/W0RSP 51

NOVICE: THE PHILLIPS CODE, PART II
Bill Welsh, W6DDB 56

A 160 METER VERTICAL ANTENNA
Robert G. Evans, K6QAY and A.E. "Doc" Nelson, K6ZHJ 66

CRANIUM QUERIES: FIND THE ERROR, LAST MONTH'S SOLUTION *Martin Bradley Weinstein, WB8LBV* 69

MATH'S NOTES: THE LM331 VOLTAGE TO FREQUENCY CONVERTER *Irwin Math, WA2NDM* 71

DEPARTMENTS

AWARDS: STORY OF THE MONTH – HOWARD A. GIFFORD, WA2WCW *A. Edward Hopper, W2GT* 41

DX: THE WEST COAST DX BULLETIN, KERGUELEN
Rod Linkous, W7OM 73

CONTEST CALENDAR: CONTESTS FOR NOVEMBER AND EARLY DEC. *Frank Anzalone, W1WY* 78

PROPAGATION: SHORT SKIP CHARTS FOR NOV. AND DEC. *George Jacobs, W3ASK* 84

ANNOUNCEMENTS.....22
HAM SHOP.....90
OUR READERS SAY.....34
ZERO BIAS.....4

Zero Bias

an editorial

Changing Quarters

CQ Magazine is moving, changing and getting better.

CQ Magazine is about to become the "new kids on the block." The only difference this time is that the "new kids" aren't so "new" after all.

Since our first issue in January 1945, ushering in both peace and the new dawn of amateur radio to a world climaxing in a great war, to this month in 1979, *CQ* has weathered and witnessed phenomenal changes in amateur radio. We have devoted editorial space, stuck our neck out at times to support innovations and innovators, and provided a forum for ideas and expression that have worked towards the growth and enjoyment of our pastime. We have seen and reported on the rise in technology, the rise in political awareness and the subtle rise in our sophistication whereby we can utilize computers, access satellites and think and act in terms considered science fiction back in 1945. I don't think Sanford Cowan had all that in mind when he started *CQ*, but he certainly was an integral part of making it possible.

This month *CQ* embarks on another journey into the future. *CQ* Magazine has been sold to a new publishing house which will publish *CQ* as of the December issue. *CQ* Magazine, as I said earlier will become the "new kids" on the block" *but,* and I said an important *but* , the "new kids" aren't so new after all. The new Publisher for *CQ* will be Dick Ross, K2MGA, who many of you recall as Editor of *CQ* a few years back. Dick has been Associate Publisher, Vice President and General Manager of Cowan Publishing since those days and has maintained an active interest in *CQ* during his nineteen years with Cowan. I will remain as Editor of *CQ* and joining Dick and me will be Jack Gutzeit, W2LZX, in his role as Advertising Sales Manager, and admirable job he's been doing for *CQ* these past two years. Chris Kelly who's been my Editorial Assistant for almost three years is the fourth member of our team. She's handled your logs (Contest Dept. Manager), awards (Awards Dept. Manager), requests (Requests Dept. Manager) and any other title we can give her (in lieu of a staff).

What do these changes mean to you? First let me state that all of the awards and programs will be maintained and encouraged. All of our contests and contest related activities likewise will be maintained and encouraged. What you have come to rely on, trust, and look forward to will still be there and probably a lot more.

What the change basically means is a change in management and the opportunity that comes with change. You can bet that we're going to keep working as hard as possible to give you the best magazine in amateur radio. During the next few weeks we'll be moving to our new offices, setting them up and producing the December issue all at the same time. It's exciting to contemplate and quite a task to accomplish. . .but we're going to do it.

On page 22 of this issue is a Message From The Publisher, Richard A. Cowan, WA2LRO, outlining the change. I've known Dick Cowan for over twenty years, back in the days when I used to work him on six meters regularly. I remember the day that I came to work for him and the then Editor, Arne Trossman, W2DTJ. It's been a long relationship over the years and in a way it's sad to leave. I've enjoyed my years at Cowan Publishing and the many friends I've made here. I'm fortunate in that I'll still be with my close friends and working on *CQ* Magazine.

I want to take this opportunity to thank Dick Cowan for giving me the chance to start a career in publishing and especially with *CQ*. He extended me the freedom few Editors enjoy in that he never sought to censor my Editorials even when they may have been contrary to his beliefs. I've appreciated that trust and faith and friendship. I wish Cowan Publishing every continued success in the years to come.

Our new address will be 76 N. Broadway, Hicksville, New York 11801. Of course mail that is still delivered to the current address will be forwarded quickly. I'll have the new phone numbers for you and any other pertinent information in our next issue.

For any of you planning to drop into the *CQ* offices to pick up log forms, be prepared to pick up a broom, be given a hammer or asked to file away some folders. We're going to need your best wishes, thoughts and most of all your continued patience. It's all new, exciting and challenging and truthfully we all can't wait for it to begin. The only problem I can see is retraining my car not to turn down Vanderventer Ave. automatically those cold dark early winter mornings.

73, Alan, K2EEK

New OMNI/SERIES B Filters The Crowd

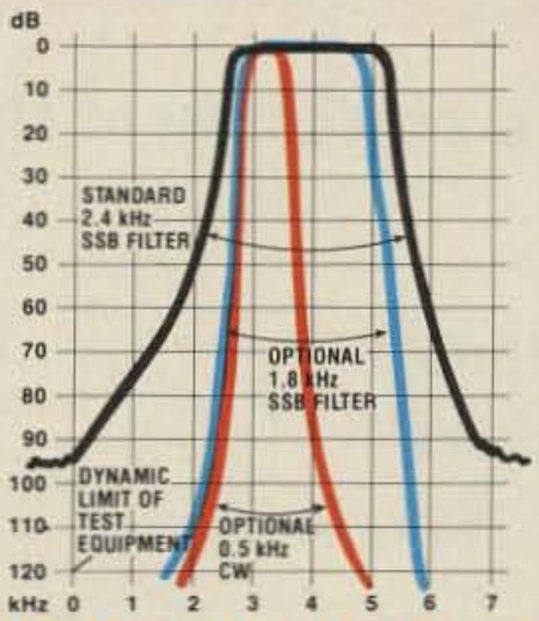
The new OMNI/SERIES B makes today's bands seem less crowded. By offering a new i-f selection that provides up to 16 poles of filtering for superior selectivity. And a new Notch Filter to remove QRM. No other amateur transceiver we know of out-performs it.

NEW I-F RESPONSE SELECTION. OMNI comes equipped with an excellent 8-pole 2.4 kHz crystal ladder i-f filter which is highly satisfactory in normal conditions. But when the going gets rough, the new OMNI/SERIES B, with optional filters installed, provides two additional special purpose i-f responses.

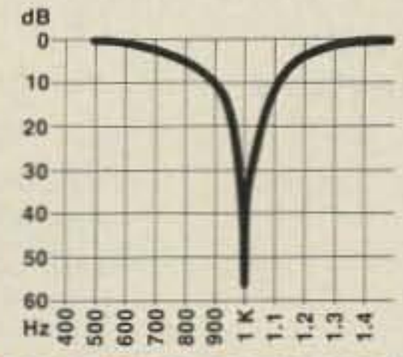
The 1.8 kHz crystal ladder filter transforms an unreadable SSB signal in heavy QRM into one that gets the message through. The 0.5 kHz 8-pole filter provides extremely steep and deep skirts to the CW passband window which effectively blocks out even the very strong adjacent signals.

Both of these filters can be front-panel switched in series with the standard filter to provide up to **16 poles** of filtering for near-ultimate selectivity. In addition, the standard CW active audio filters have three bandwidths (450, 300, and 150 Hz) to give even further attenuation to adjacent signals. In effect, OMNI/SERIES B has six selectivity curves—three for SSB and three for CW. That's true state-of-the-art selectivity.

NEW NOTCH FILTER. A variable frequency notch filter in OMNI/SERIES B is placed inside the AGC loop to eliminate interfering carriers and CW signals without affecting received signals. Attenuation is more than 8 "S" units (over 50 db) for any frequency between 0.2 kHz and 3.5 kHz.



OMNI/SERIES B I-F RESPONSES WITH STANDARD AND OPTIONAL FILTERS.



NOTCH FILTER PERFORMANCE ADJUSTED TO 1 kHz POINT.

OMNI/SERIES B RETAINS ALL THE FEATURES THAT MADE IT FAMOUS.

All solid-state; 160-10 meters plus convertible 10 MHz and AUX band positions; **Broadband design** for band changing without tuneup, without danger; **Choice of readouts** —OMNI-A for analog dial or OMNI-D for digital dial; **Built-in VOX and PTT** facilities; **Selectable Break-in,** instant or delayed receiver muting; **Dual-Range Receiver Offset Tuning,** ±5 kHz or ±0.5 kHz; **Wide Overload Capabilities,** dynamic range typically exceeds 90 dB and a PIN diode switched 18 dB attenuator is also included; **Phone Patch Interface Jacks; Adjustable ALC; Adjustable Sidetone; Exceptional Sensitivity; 200 Watts** input to final with full warranty on final transistors for first year, pro-rata for 5 years; **100% Duty Cycle** for RTTY, SSTV or sustained hard usage; **12 VDC Circuitry** for mobile use, external supplies for 117/220 VAC operation; **Front Panel Microphone and Key Jacks; Built-in 25 kHz Calibrator** in analog dial model; **Zero-Beat Switch; "S"/SWR Meter; Dual Speakers; Plug-In Circuit Boards; Functional Styling,** black textured vinyl over aluminum "clamshell" case, complementary nonreflective warm dark metal front panel; **Complete Shielding; Easier-to-use size:** 5¾"h x 14¼"w x 14"d; **Full Options:** Model 645 Keyer $85; Model 243 Remote VFO $139; Model 252MO matching AC power supply $139; Model 248 Noise Blanker $49; Model 217 500 Hz 8-pole Crystal Ladder CW Filter $55; Model 218 1.8 kHz 8-pole Crystal Ladder SSB Filter $55;

OMNI owners note: Your OMNI can be converted to a SERIES B model at the factory for just $50 (plus $5 for packing and shipping). The notch filter replaces your present squelch control and provision is made for the two additional optional filters; a partial panel with new nomenclature is provided. Contact us for details.

Model 545 Series B OMNI-A $949
Model 546 Series B OMNI-D $1119

Experience the uncrowded world of OMNI/SERIES B. See your TEN-TEC dealer or write for full details.

TEN-TEC, INC.
SEVIERVILLE, TENNESSEE 37862
EXPORT:5715 LINCOLN AVE., CHICAGO, ILL. 60646

Please send all reader inquiries directly

CONTEST
CONTEST
CONTEST
Contest
Contest

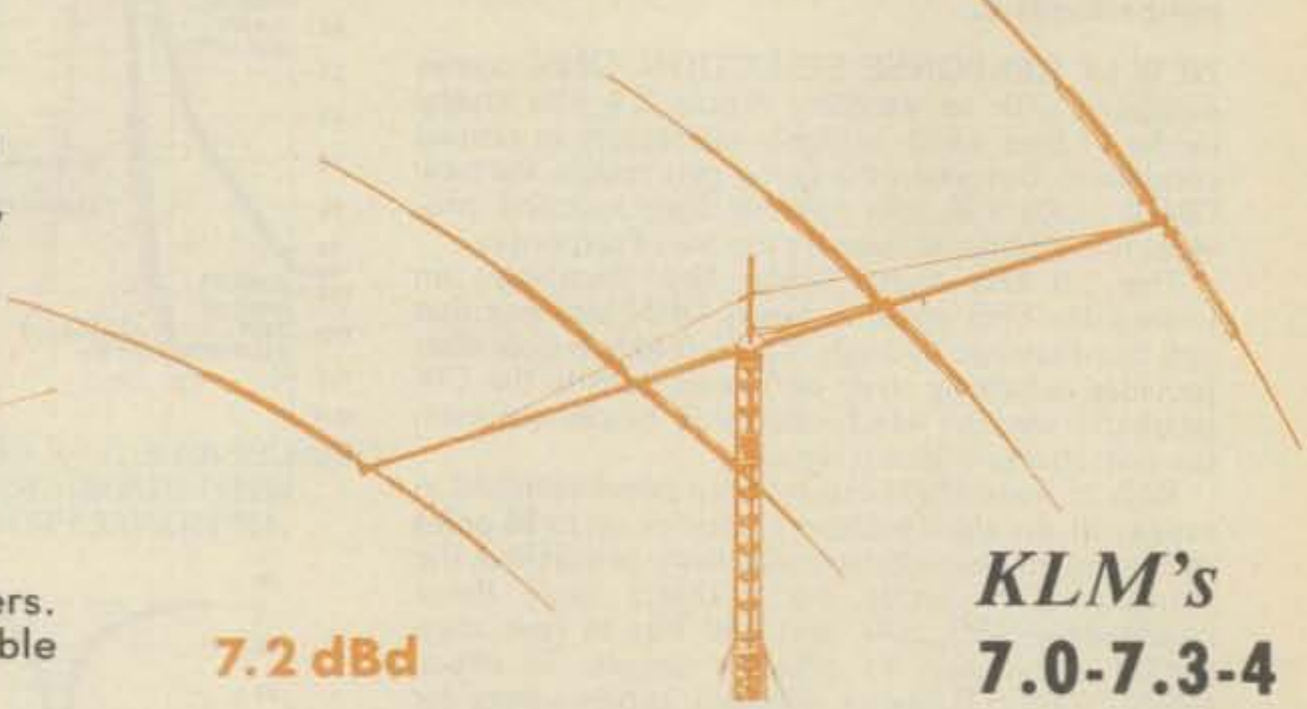
WINNERS

Now with booms of strong 6063-T832 alloy tubing!

KLM's 5 & 6 Element "Big Stickers"

9.7-11 dBd

The Contesters choice for DX on 20, 15 or 10 meters. KLM's world famous "Big Stickers" offer unbeatable gain, F/B, bandwidth and pattern.

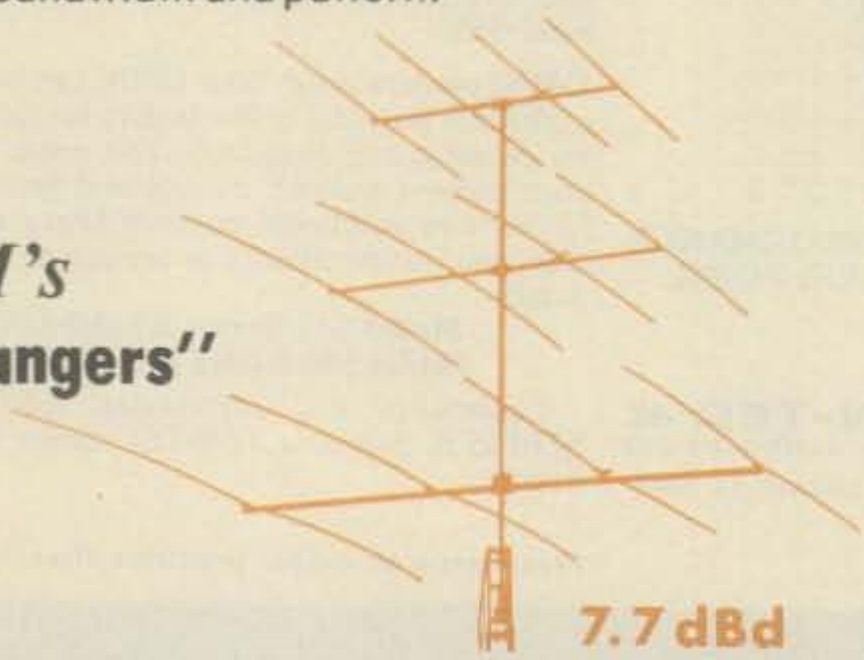


7.2 dBd

KLM's 7.0-7.3-4

DX punch on 40 meters. Constant gain and low VSWR across the band-phone and CW. Linear loaded to reduce size and weight.

KLM's "4-Bangers"

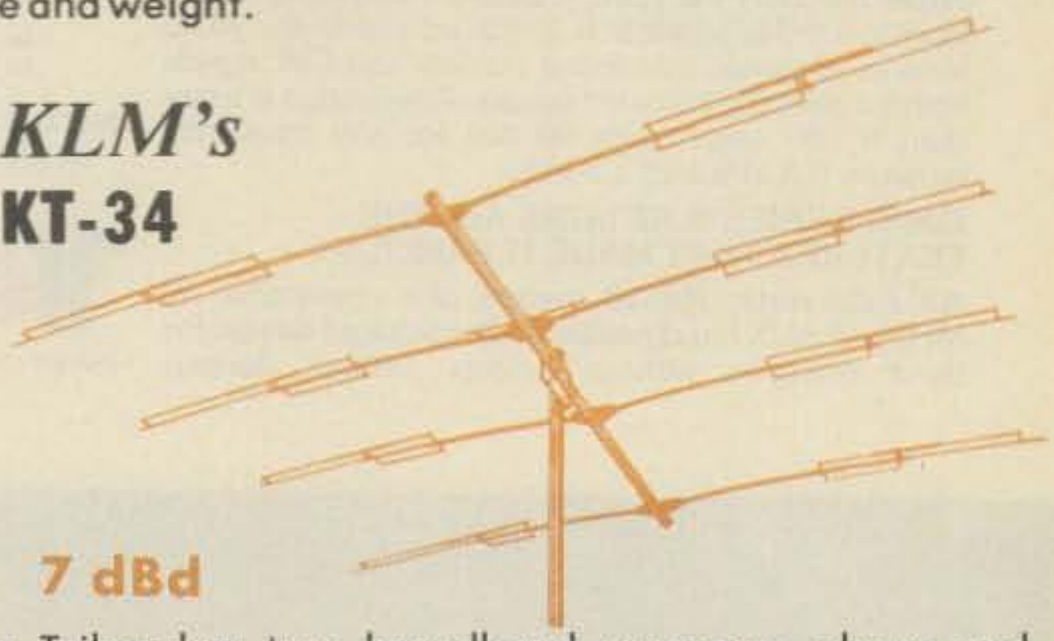


7.7 dBd

for 20, 15, or 10 Meters

4 Element monobander power at a reasonable price. Full performance across each band, no tuning or matching. One man installation, stackable, ideal for lightduty towers and rotators.

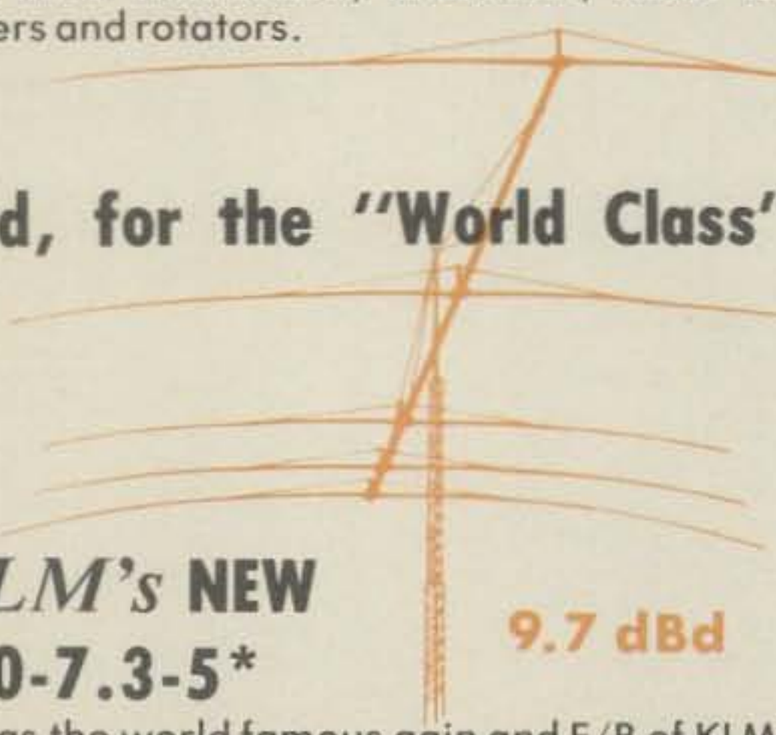
KLM's KT-34



7 dBd

The Tribander: true broadband coverage, phone and CW, on 20, 15 and 10 meters with no tuning or matching. Handles 4 KW with extraordinary efficiency.

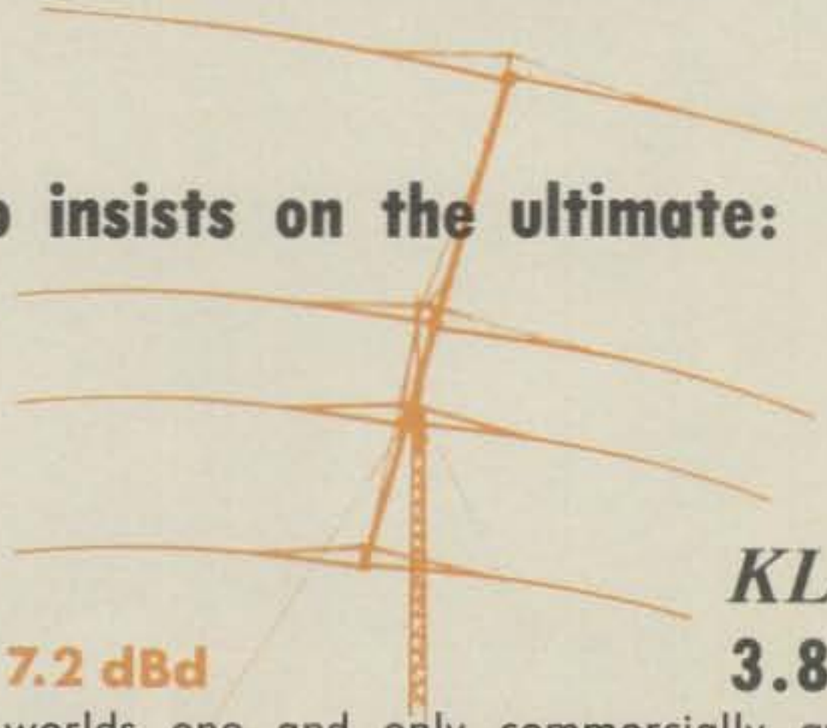
And, for the "World Class" Amateur who insists on the ultimate:



KLM's NEW 7.0-7.3-5*

9.7 dBd

Brings the world famous gain and F/B of KLM's 20 meter, 5 element "Big Sticker" to 40 meters; delivers unchallenged performance all across the band.



7.2 dBd

KLM's 3.8-4*

The worlds one and only commercially available rotatable 80 meter beam. The 3.8-4 is simply unchallenged in it's class.

*BUILT ONLY TO YOUR ORDER. CALL KLM FOR DETAILS AND SPECIFICATIONS.

KLM 17025 LAUREL ROAD, MORGAN HILL, CALIFORNIA 95037 • (408) 779-7363

CIRCLE 135 ON READER SERVICE CARD

"What's new from Rockwell-Collins?"

"Plenty. But they're not talking till the Midwest A.R.R.L. Convention."

See us at the Midwest Division Convention, Oct. 19-21, Cedar Rapids, Iowa.

Rockwell International

...where science gets down to business

CIRCLE 63 ON READER SERVICE CARD

Value where it counts.

Count up to 550 MHz or more, count down to $69.95.* Smaller size, lower prices and professional accuracy help make CSC portable frequency counters the best in the business.

MAX-550 lets you count up to 550 MHz on your fingers! This amazing counter is as small as some pocket calculators, yet offers continuous six-digit readings from 30 KHz to 550 MHz, updated six times a second to speed your work. Battery powered, it's just $149.95.*

MAX-100 measures down to the last Hertz from 20 Hz to past 100 MHz, displaying the count on eight big 0.6" LED digits. It's battery operated, portable, and perfect for professional precision applications—and just $134.95.*

MAX-50 in its calculator-sized case lets you grab ahold of 100 Hz to 50 MHz and displays the count on six bright LED digits. Its accessory mini-whip antenna even lets you pick up RF fields when a cable is inconvenient. And it's a speed reader, with six updates per second. All for just $69.95.*

PS-500 is our very capable Buffered Prescaler, which extends the range of almost any frequency counter ten times, up to 500 MHz. Its buffered 400 mV output can drive even tired old counters reliably. And you can add this extra capability for just $59.95.*

We have a full line of accessories, too, including cables, battery charger/eliminators and more.

From audio to UHF, microprocessor to radio control, whatever your application, you can count on CSC frequency counters for performance—and value—where it counts.

70 Fulton Terr., New Haven, CT 06509 (203) 624-3103, TWX 710-465-1227
OTHER OFFICES: San Francisco (415) 421-8872, TWX 910-372-7992
Europe: CSC UK LTD. Phone Saffron-Walden 0799-21682, TLX 817477
Canada: Len Finkler Ltd., Ontario

CONTINENTAL SPECIALTIES CORPORATION

Call toll-free for details
1-800-243-6077

Smarter tools for testing and design.

* Suggested U.S. resale. Available at selected local distributors. Prices, specifications subject to change without notice. © Copyright 1979 Continental Specialties Corporation

CIRCLE 11 ON READER SERVICE CARD

Get Everything Ham Radio Has to Offer with Heath®

A big part of the enjoyment of Amateur Radio is firing up a rig that you built with your own hands. With Heathkit® Amateur Radio gear, you get more from your hobby by building it yourself...and you get more for your money, too. You save money over comparable assembled units, and you save by servicing your own equipment. Of course, technical assistance is available, if you need it, at 55 Heathkit sales and service locations from coast to coast. Just a phone call away. If you've never built a kit from Heath, you're in for a pleasant surprise. The instruction manual that comes with every kit is the best you'll find anywhere. As one first-time kit builder put it, "If you're not color-blind (for differentiating resistor and wire colors), you can build anything in the Heathkit catalog."

HW-8 QRP Transceiver

HX-1681 CW Transmitter
HR-1680 Receiver

SB-104A All Solid State Transceiver and Station Aids

1kW and 2kW Linear Amps

HW-101 SSB/CW Transceiver

VF-2031 Hand-held 2-Meter Transceiver

HW-2036A Synthesized 2-Meter Transceiver

The latest Heathkit Catalog features complete information on nearly 400 quality electronic kits you can build for pride, satisfaction and savings. Send for your FREE copy now.

If coupon is missing, write to: Heath Company, Dept. 012-590, Benton Harbor, MI 49022

FREE HEATHKIT CATALOG

There's more for the Ham at Heath!

HEATH
Schlumberger

Heath Company, Dept. 012-590
Benton Harbor, MI 49022

MAIL THIS COUPON TODAY

Please send me my FREE Heathkit Catalog.
I am not on your mailing list.

Name _____

Address _____

City _____ State _____

AM-396 Zip _____

DXpedition...The Ultimate Fantasy

Clipper ships sailing to foreign shores. Sixteen amateurs primed for adventure, coming together as the first group in 20 years to set foot on the remote French Island, Clipperton. Their goal: 30,000 QSO's in just 7 days.

If you're like most of us, a rare DXpedition is more a dream than a reality, but the Clipperton Linear Amplifier from DenTron brings the thrill of a DXpedition to you.

The Clipperton-L™ was inspired by the famous DXpedition on which 3 MLA-2500's were used. We built the Clipperton with 4 rugged, economical, 572 B's in the final to provide a full 2KW PEP on SSB and 1KW CW on 15 through 160 meters. With features like hi-lo power selector for equal efficiencies at 1 or 2 KW, a power transformer that is vacuum impregnated, wide spaced tuning and loading capacitors, built-in ALC and an improved whisper-quiet cooling system, the excitement of crashing a pile-up can be yours.

Clipperton-L suggested price $699.50
FCC type accepted.

CIRCLE 17 ON READER SERVICE CARD

DenTron
Radio Co., Inc.
2100 Enterprise Parkway
Twinsburg, Ohio 44087
(216)425-3173

Dedicated to making amateur radio more fun.

Talk is cheap.

It's time we stopped talking about child abuse and did something. Here are some of the actions your company can take to prevent the suffering caused by child abuse and also give your community a better business environment.

We want to stop the hurt.

- ☐ We are enclosing a tax-deductible donation in the name of our company.
- ☐ We want to help. Please call our company and tell us what you're doing to stop the hurt of child abuse in our community.
- ☐ We want to make our employees more aware. We will carry an article about child abuse in our company publication.
- ☐ We will volunteer our employees' time and talent to community child abuse prevention programs.
- ☐ We will plan a day for employees' children to visit our place of work to learn what we do and why.
- ☐ I don't spend enough time with my children. Tonight I am going home early to find out who my children are.
- ☐ Please send us ____ copies of the pamphlet "Prevent Child Abuse" at 10¢ a copy for 100 copies or more.

Name _____

Company _____

Address _____

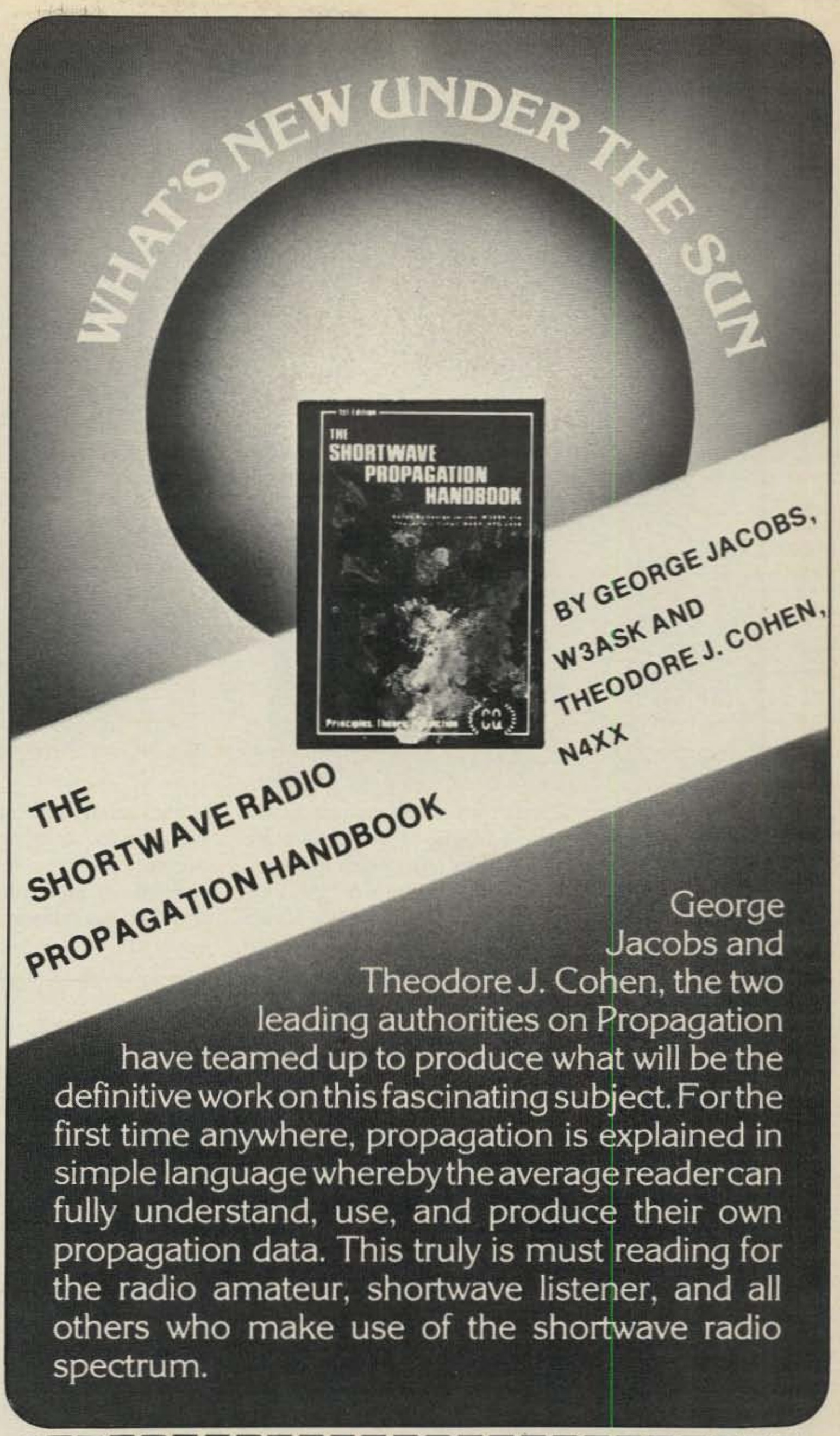
City, State, Zip _____

prevent child abuse.

write: Box 2866, Chi., Ill. 60690

National Committee for Prevention of Child Abuse

Ad Council A Public Service of This Magazine & The Advertising Council



George Jacobs and Theodore J. Cohen, the two leading authorities on Propagation have teamed up to produce what will be the definitive work on this fascinating subject. For the first time anywhere, propagation is explained in simple language whereby the average reader can fully understand, use, and produce their own propagation data. This truly is must reading for the radio amateur, shortwave listener, and all others who make use of the shortwave radio spectrum.

CQ 14 Vanderventer Ave.
Port Washington, N.Y. 11050

Quantity ordered _____
Amount enclosed _____

Please rush me _____ copies at $7.50 each.

Check One: ☐ Check ☐ Money Order ☐ Master Charge ☐ Bank Americard

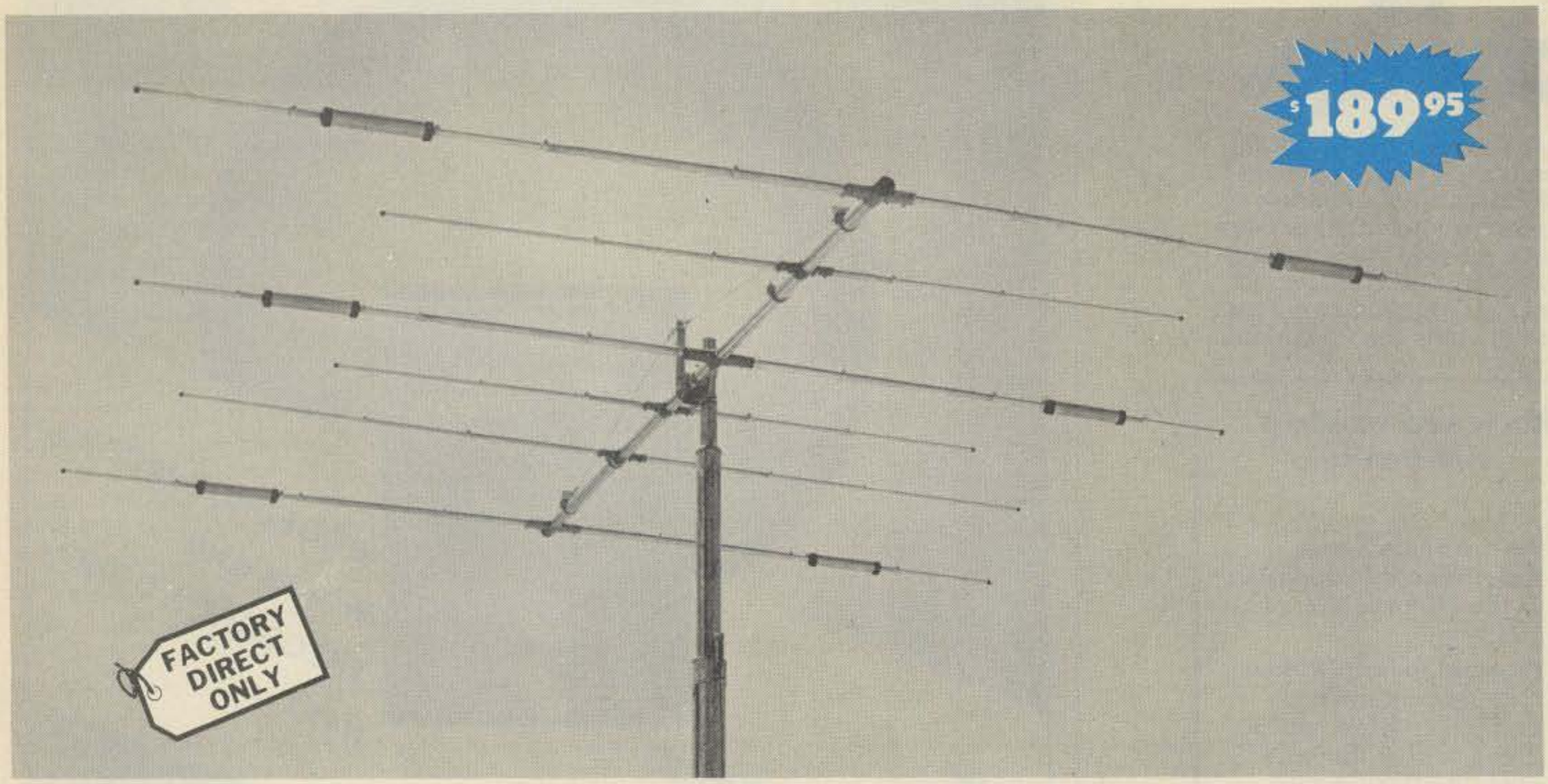
My account number is

Name _____ Call _____

Address _____

City _____ State _____ Zip _____

WILSON SYSTEMS, INC. presents the SYSTEM 36

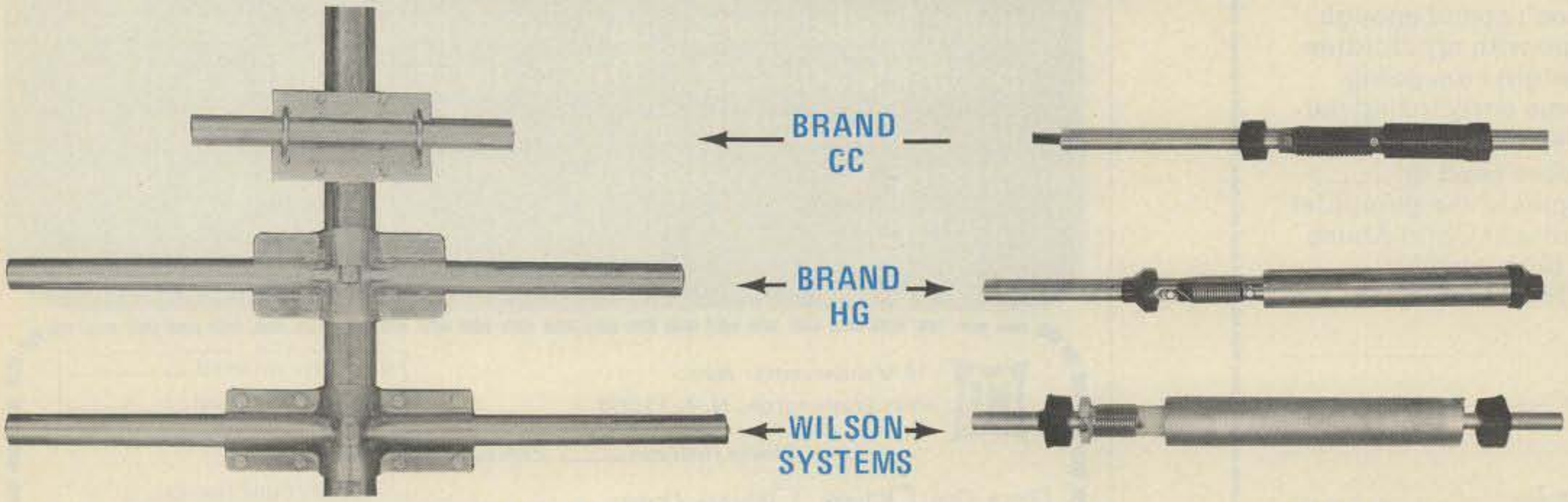


A trap loaded antenna that performs like a monobander! That's the characteristic of this six element three band beam. Through the use of wide spacing and interlacing of elements, the following is possible: three active elements on 20, three active elements on 15, and four active elements on 10 meters. No need to run separate coax feed lines for each band, as the bandswitching is automatically made via the High-Q Wilson traps. Designed to handle the maximum legal power, the traps are capped at each end to provide a weather-proof seal against rain and dust. The special High-Q traps are the strongest available in the industry today.

SPECIFICATIONS

Band MHz 14-21-28	**Boom (O.D. x Length)** . . 2" x 24'2½"	**Wind loading @ 80 mph** . . 215 lbs.
Maximum power input . Legal limit	**No. of elements.** 6	**Maximum wind survival** . . 100 mph
Gain (dBd). . . . . Up to 9 dB	**Longest element** . . . . . 28'2½"	**Feed method** . . . . . Coaxial Balun
VSWR @ resonance . . . 1.3:1	**Turning radius** . . . . . 18'6"	**Assembled weight (approx.** 53 lbs.
Impedance . . . . . 50 Ω	**Maximum mast diameter.** 2"	**Shipping weight (approx.)**. 62 lbs.
F/B ratio . . . . . 20 dB or better	**Surface area** . . . . . 8.6 sq. ft.	

Compare the SY-36 with others . . .



Compare the size and strength of the boom to element clamps. See who offers the largest and heaviest duty. Which would you prefer?

Wilson Systems traps offer a larger diameter trap coil and a larger outside housing, giving excellent Q and power capabilities.

CALL FACTORY DIRECT 1-800-634-6898

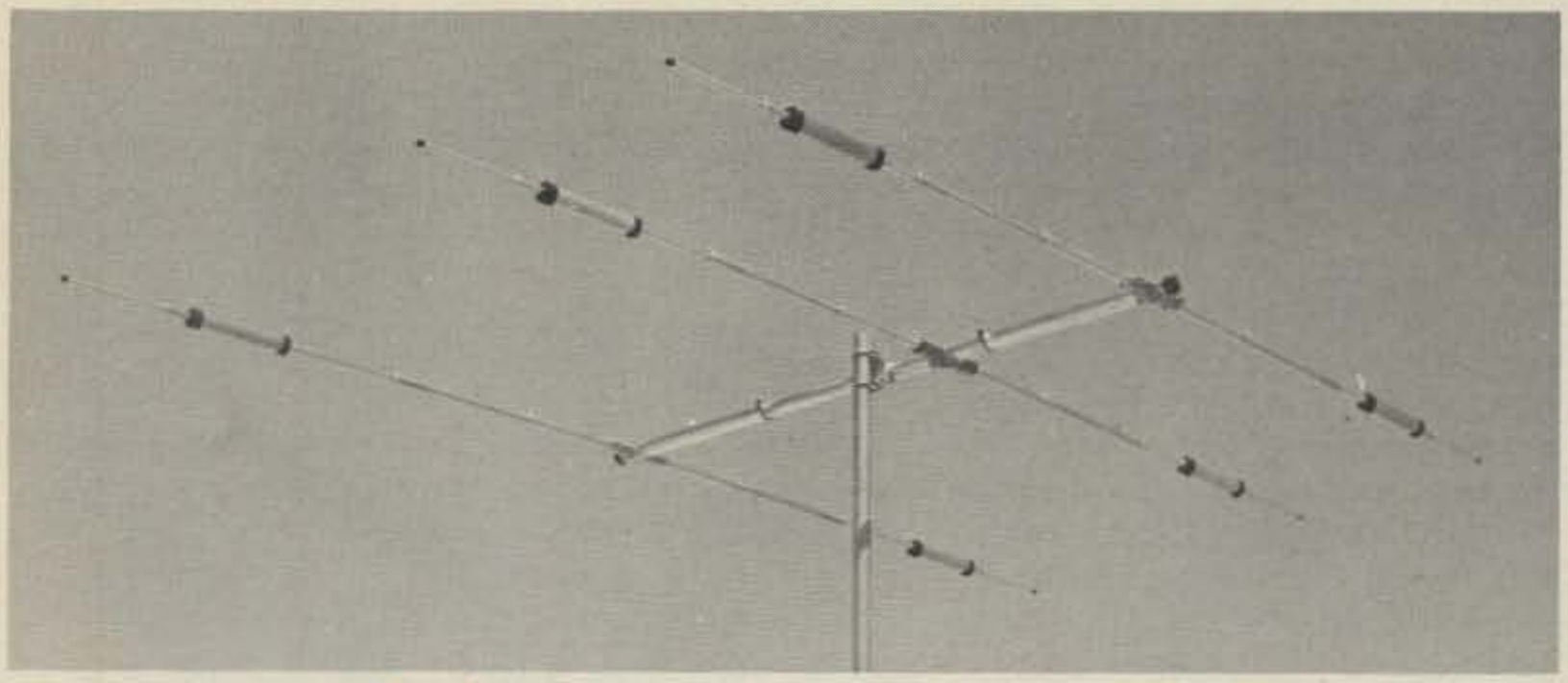
WSI WILSON SYSTEMS, INC.

4286 S. Polaris Ave., Las Vegas, Nevada 89103

Prices and specifications subject to change without notice.

CIRCLE 70 ON READER SERVICE CARD

WILSON SYSTEMS INC. MULTI-BAND ANTENNAS



$139.95

SYSTEM 33

(FORMERLY SYSTEM THREE)

FACTORY DIRECT ONLY

Capable of handling the Legal Limit, the "SYSTEM 33" is the finest compact tri-bander available to the amateur.

Designed and produced by one of the world's largest antenna manufacturers, the traditional quality of workmanship and materials excells with the "SYSTEM 33".

New boom-to-element mount consists of two 1/8" thick formed aluminum plates that will provide more clamping and holding strength to prevent element misalignment.

Superior clamping power is obtained with the use of a rugged 1/4" thick aluminum plate for boom to mast mounting.

The use of large diameter High-Q traps in the "SYSTEM 33" makes it a high performing tri-bander and at a very economical price.

A complete step-by-step illustrated instruction manual guides you to easy assembly and the lighweight antenna makes installation of the "SYSTEM 33" quick and simple.

The same quality traps are used in the SY33 that are used in the SY36.

SPECIFICATIONS

Band MHz	14-21-28	Turning radius	15'9"
Maximum power input	Legal limit	Maximum mast diameter	2" O.D.
Gain (dbd)	Up to 8 dB	Surface area	5.7 sq. ft.
VSWR at resonance	1.3:1	Wind loading at 80 mph	114 lbs.
Impedance	50 ohms	Assembled weight (approx.)	37 lbs.
F/B ratio	20 dB or better	Shipping weight (approx.)	42 lbs.
Boom (O.D. x length)	2" x 14'4"	Direct 52 ohm feed—no balun required	
No. elements	3	maximum wind survival	100 mph
Longest element	27'4"		

CALL
FACTORY DIRECT
1-800-634-6898

WSI WILSON SYSTEMS, INC.

4286 S. Polaris Ave., Las Vegas, Nevada 89103

Prices and specifications subject to change without notice.

CIRCLE 71 ON READER SERVICE CARD

$44.95

WV-1A

4 BAND TRAP VERTICAL (10 - 40 METERS)

No bandswitching necessary with this vertical. An excellent low cost DX antenna with an electrical quarter wavelength on each band and low angle radiation. Advanced design provides low SWR and exceptionally flat response across the full width of each band.

Featured is the Wilson large diameter High-Q traps which will maintain resonant points with varying temperatures and humidity.

Easily assembled, the WV-1A is supplied with a hot dipped galvanized base mount bracket to attach to vent pipe or to a mast driven in the ground.

Note:
Radials are required for peak operation.
(See GR-1 below).

SPECIFICATIONS:

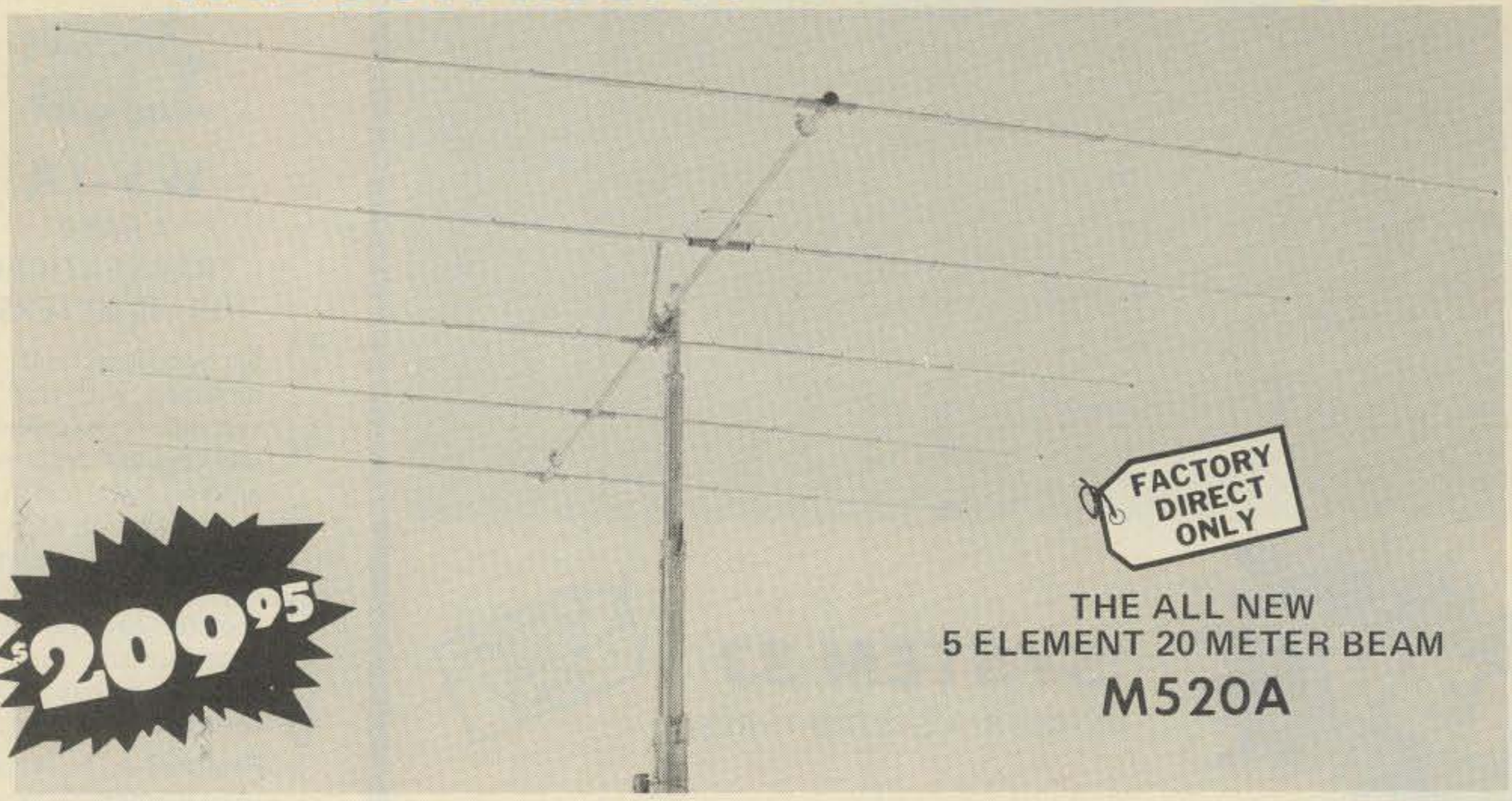
- Self supporting—no guys required.
- Input Impedance: 50 Ω
- Powerhandling capability: Legal Limit
- Two High-Q Traps with large diamater coils
- Low Angle Radiation
- Omnidirectional performance
- Taper Swaged Aluminum Tubing
- Automatic Bandswitching
- Mast Bracket furnished
- SWR: 1.1:1 or less on all Bands

GR-1

$9.95

The GR-1 is the complete ground radial kit for the WV-1A. It consists of: 150' of 7/14 stranded copper wire and heavy duty egg insulators, instructions. The GR-1 will increase the efficiency of the GR-1 by providing the correct counterpoise.

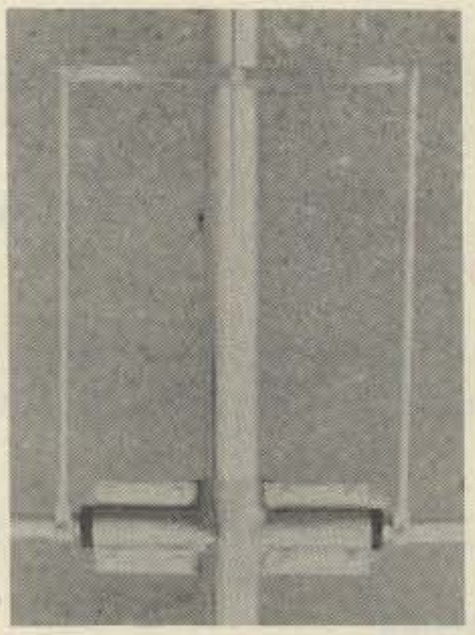
WILSON MONO-BAND BEAMS



At last, the antennas that you have been waiting for are here! The top quality, optimum spaced, and newest designed monobanders. The Wilson Systems' new Monoband beams are the latest in modern design and incorporate the latest in design principles utilizing some of the strongest materials available. Through the select use of the current production of aluminum and the new boom to element plates, the Wilson Systems' antennas will stay up when others are falling down due to heavy ice loading or strong winds. Note the following features:

1. Taper Swaged Elements — The taper swaged elements provide strength where it counts and lowers the wind loading more efficiently than the conventional method of telescoping elements of different sizes.
2. Mounting Plates — Element to Boom — The new formed aluminum plates provide the strongest method of mounting the elements to the boom that is available in the entire market today. No longer will the elements tilt out of line if a bird should land on one end of the element.
3. Mounting Plates — Boom to Mast — Rugged 1/4" thick aluminum plates are used in combination with sturdy U-bolts and saddles for superior clamping power.
4. Holes— There are no holes drilled in the elements of the Wilson HF Monobanders. The careful attention given to the design has made it possible to eliminate this requirement as the use of holes adds an unneccessary weak point to the antenna boom.

With the Wilson Beta-match method, it is a "set it and forget it" process. You can now assemble the antenna on the ground, and using the guidelines from the detailed instruction manual, adjust the tuning of the Beta-match so that it will remain set when raised to the top of the tower.



Wilson's Beta match offers maximum power transfer.

The Wilson Beta-match offers the ability to adjust the terminating impedance that is far superior to the other matching methods including the Gamma match and other Beta-matches. As this method of matching requires a balanced line it will be necessary to use a 1:1 balun, or RF choke, for the most efficient use of the HF Monobanders.

The Wilson Monobanders are the perfect answer to the Ham who wants to stack antennas for maximum utilization of space and gain. They offer the most economical method to have more antenna for less money with better gain and maximum strength. Order yours today and see why the serios DXers are running up that impressive score in contests and number of countries worked.

SPECIFICATIONS

Model	Band Mtrs	Gain dBd	F/B Ratio	Bandwidth @ Resonance 2:1 VSWR Limits	VSWR @ Resonance	Impedance	Matching	Elements	Longest Element	Boom O.D.	Boom Length	Turning Radius	Surface Area (Sq.Ft.)	Windload @ 80 mph (Lbs.)	Maximum Mast	Assembled Weight (Lbs.)
M520A	20	11.5	25 dB	500 KHz	1.1:1	50 Ω	Beta	5	36'6"	2"	34'2½"	25'1"	8.9	227	2"	68
M420A	20	10.0	25 dB	500 KHz	1.1:1	50 Ω	Beta	4	36'6"	2"	26'0"	22'6"	7.6	189	2"	50
M515A	15	12.0	25 dB	400 KHz	1.1:1	50 Ω	Beta	5	25'3"	2"	26'0"	17'6"	4.2	107	2"	41
M415A	15	10.0	25 dB	400 KHz	1.1:1	50 Ω	Beta	4	24'2½"	2"	17'0"	14'11"	3.1	54	2"	25
M510A	10	12.0	25 dB	1.5 MHz	1.1:1	50 Ω	Beta	5	18'6"	2"	26'0"	16'0"	2,8	72	2"	36
M410A	10	10.0	25 dB	1.5 MHz	1.1:1	50 Ω	Beta	4	18'3"	2"	12'11"	11'3"	1.4	36	2"	20

CALL FACTORY DIRECT 1-800-634-6898

WSI WILSON SYSTEMS, INC.

4286 S. Polaris Ave., Las Vegas, Nevada 89103

Prices and specifications subject to change without notice.

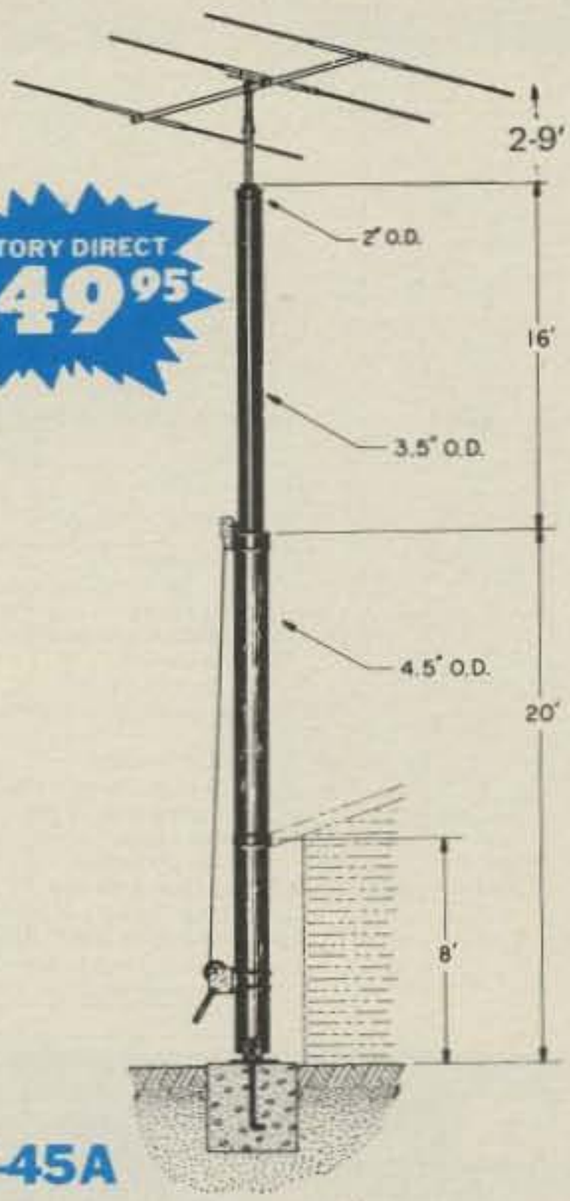
CIRCLE 72 ON READER SERVICE CARD

New, Improved Wilson Towers

Hinged Base Plate - Concrete Pad, Heavy Duty Winch

Mounting the House Bracket

The Hinged Base Plate allows tower to be tilted over for access to antenna and rotor from the ground.



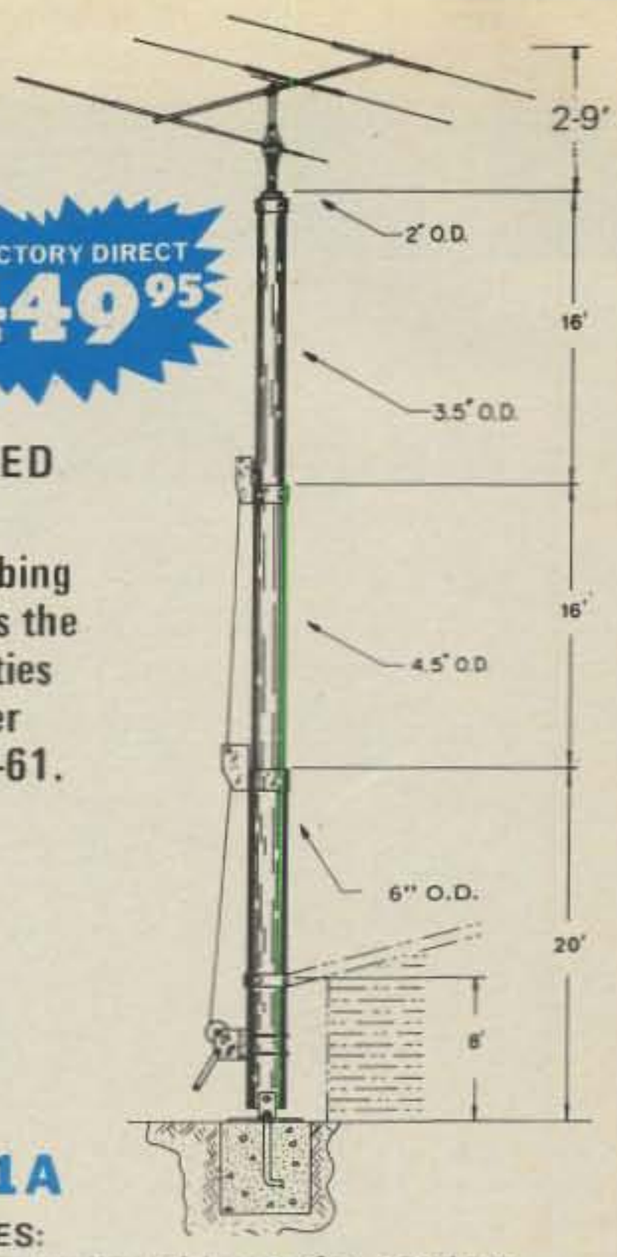
FACTORY DIRECT $249.95

TT-45A

FEATURES:

- Maximum Height 45' (will handle 12 sq. ft. at 38') @ 50 mph
- 1200 lb. winch
- Totally freestanding with proper base
- Total Weight, 243 lbs.

The TT-45A is a freestanding tower, ideal for installations where guys cannot be used. If the tower is not being supported against the house, the proper base fixture accessory must be selected. (Requires 12"x12"x36" of concrete.)



FACTORY DIRECT $449.95

NEW IMPROVED FEATURE

Heavier wall tubing greatly increases the stress capabilities over the older TT-45 and MT-61.

MT-61A

FEATURES:

- Is freestanding with use of proper base
- Maximum Height is 61' (will handle 12 sq. ft. at 53') @ 50 mph
- 1200 lb. brake winch
- 4200 lb. raising cable
- Total Weight, 400 lbs.

Recommended base accessory: RB-61A, FB-61A.

The MT-61A is our largest and tallest freestanding tower. By using the RB-61A rotating base fixture the MT-61A is ideally suited for the SY33 or SY-36. If you plan to mount the tower to your house, caution should be taken to make certain the eave is properly reinforced to handle the tower. If not, one of the base accessory fixtures should be used. (Requires 18"x18"x48" concrete.)

GENERAL FEATURES

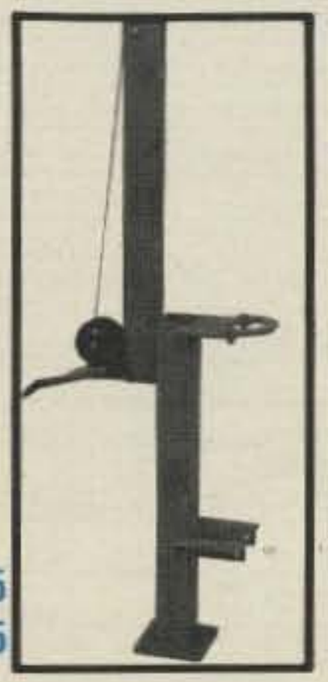
All towers use high strength heavy galvanized steel tubing that conforms to ASTM specifications for years of maintenance-free service. The large diameters provide unexcelled strength. All welding is performed with state-of-the-art equipment. Top sections are 2" O.D. for proper antenna/rotor mounting. A 10' push-up mast is included in the top section of each tower. Hinge-over base plates are standard with each tower. The high loads of today's antennas make Wilson crank-ups a logical choice.

TILT-OVER BASES FOR TOWERS

FIXED BASE

The FB Series was designed to provide an economical method of moving the tower away from the house. It will support the tower in a completely free-standing vertical position, while also having the capabilities of tilting the tower over to provide an easy access to the antenna. The rotor mounts at the top of the tower in the conventional manner, and will not rotate the complete tower. (Requires 3'x3'x5½' of concrete.)

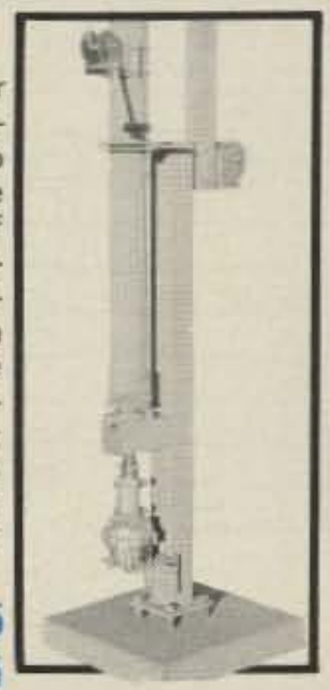
FB-45A . . . $ 99.95
FB-61A . . . 129.95



ROTATING BASE

The RB Series was designed for the Amateur who wants the added convenience of being able to work on the rotor from the ground position. This series of bases will give that ease plus rotate the complete tower and antenna system by the use of a heavy duty thrust bearing at the base of the tower mounting position, while still being able to tilt the tower over when desiring to make changes on the antenna system. (Requires 3'x3'x6' of concrete.)

RB-45A . . . $139.95
RB-61A . . . 199.95



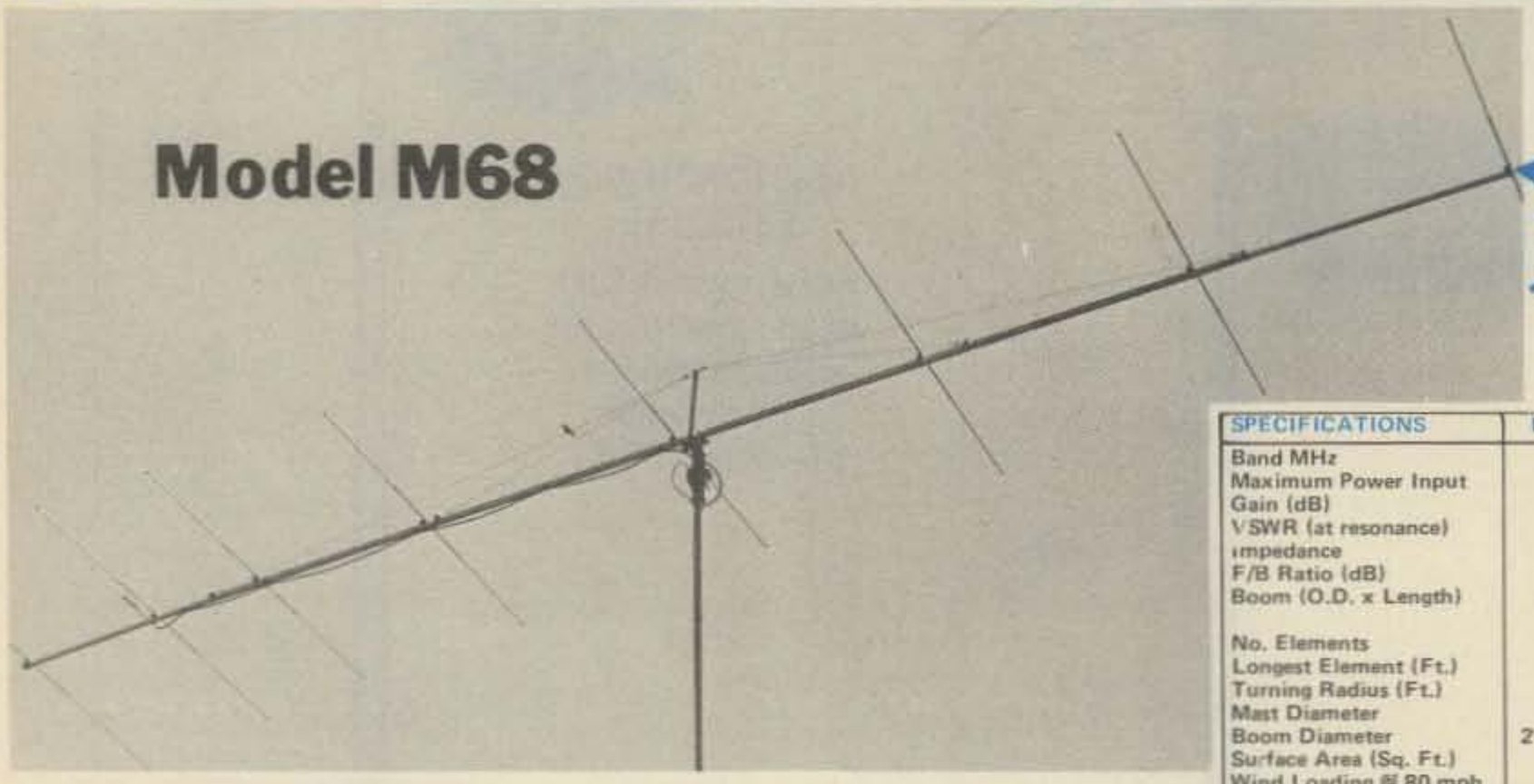
Tilting the tower over is a one-man task with the Wilson bases. (Shown above is the RB-61A.) (Rotor not included)

WSI WILSON SYSTEMS, INC.
4286 S. Polaris Avenue
Las Vegas, Nevada 89103
(702) 739-7401
Toll-Free Order Number 800-634-6898

CIRCLE 73 ON READER SERVICE CARD

Prices and specifications subject to change without notice.

6 METER BEAMS



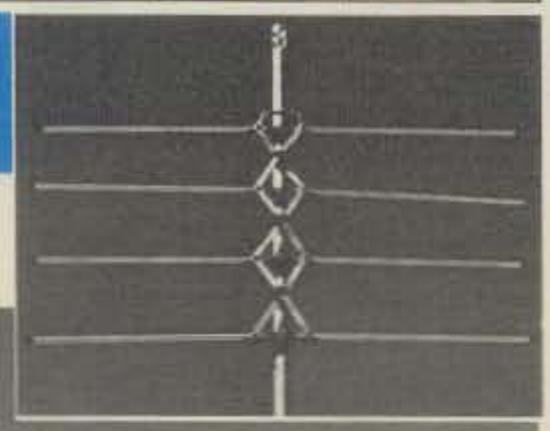
As low as $27.95

8 elements W - I - D - E spaced on a L - O - N - G 37' boom . . . for those long hauls to JA and VK land! Choose 4, 6 or 8 elements to put you in the action on six meters.

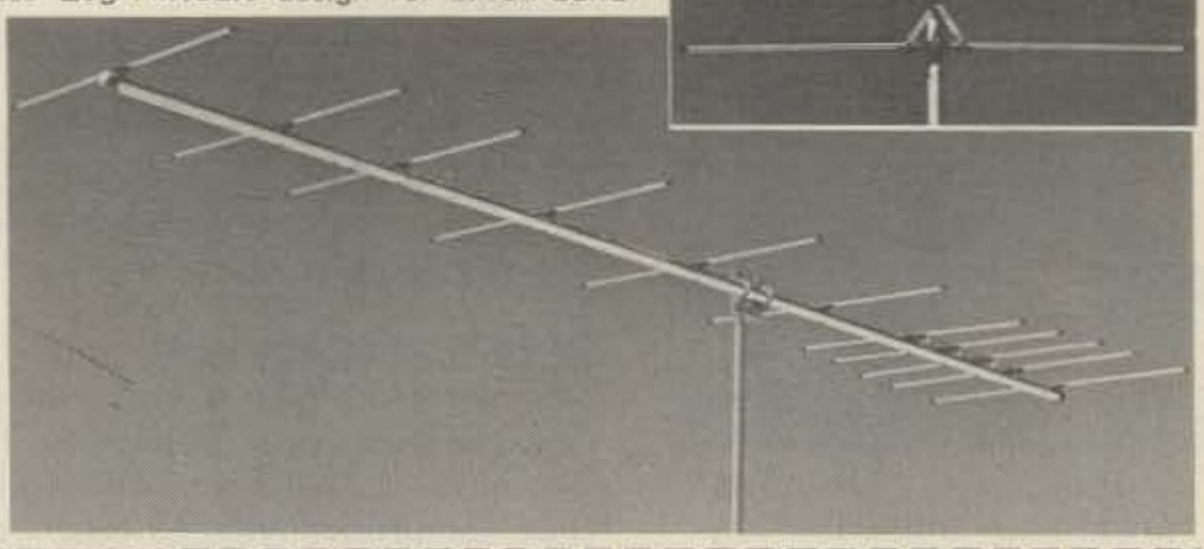
SPECIFICATIONS	MODEL M68	MODEL M66	MODEL M64
Band MHz	50	50	50
Maximum Power Input	4 Kw	4 Kw	4 Kw
Gain (dB)	13.5	13.0	10.0
VSWR (at resonance)	1.1:1	1.1:1	1.1:1
Impedance	50 ohms	50 ohms	50 ohms
F/B Ratio (dB)	26	26	25
Boom (O.D. x Length)	2" to 1½" x 36'10"	2" x 25'8"	1½" x 11'6"
No. Elements	8	6	4
Longest Element (Ft.)	9'8"	9'8"	9'8"
Turning Radius (Ft.)	19'0"	13'10"	7'6"
Mast Diameter	2" O.D.	2" O.D.	1½" O.D.
Boom Diameter	2" to 1⅝" O.D.	2" O.D.	1⅝" O.D.
Surface Area (Sq. Ft.)	5.8	4.5	1.5
Wind Loading @ 80 mph	145	112	37
Assembled wght. Approx.	34 lbs.	26 lbs.	11 lbs.
Shipping wght. Approx.	39 lbs.	31 lbs.	13 lbs.
Matching Method	Gamma	Gamma	Gamma
PRICE	$84.95	$54.95	$27.95

Starting at $19.95

2 METER BEAMS



Wilson's new 2 meter series combines the ultimate in design and quality materials. These top performing beams feature 7, 9 or 11 aluminum elements held to the heavy walled boom with the exclusive molded Lexan® boom to element mounting. The four driven elements use Log Periodic design for broad band characteristics providing full 144-148 MHz coverage with less than 1.2 to 1 VSWR across the band. Universal mounting is provided for vertical or horizontal polarization.



SPECIFICATIONS	M27	M29	M211
Band MHz	144-148 MHz	144-148 MHz	144-148 MHz
Gain (dB)	11 dB	13.7 dB	14.5 dB
VSWR	Less than 1.2:1 across band	Less than 1.2:1 across band	Less than 1.2:1 across band
Impedance	50 ohms balanced	50 ohms balanced	50 ohms balanced
Number of Elements	7	9	11
Boom (O.D. x Length)	1" O.D. x 5'4"L.	1" O.D. x 10'0"L.	1½" O.D. x 12'6"
Longest Element	40"	40"	40"
Surface Area (Sq. Ft.)	.8	1.5	2.8
Assembled wght Approx.	3.5 lbs.	5 lbs.	6 lbs.
Shipping wght. Approx.	6.5 lbs.	8 lbs.	9 lbs.
Turning Radius	38"	64"	78"
PRICE	$29.95	$24.95	$19.95

WILSON SYSTEMS, INC. – 4286 S. Polaris
Las Vegas, NV 89103 – (702) 739-7401

FACTORY DIRECT ORDER BLANK

Toll-Free Order Number
1-800-634-6898

WILSON SYSTEMS ANTENNAS

Qty	Model	Description	Shipping	Price
	SY33	3 Ele. Tribander for 10, 15, 20 Mtrs.	UPS	$139.95
	SY36	6 Ele. Tribander for 10, 15, 20 Mtrs.	UPS	189.95
	WV-1A	Trap Vertical for 10, 15, 20, 40 Mtrs.	UPS	44.95
	GR-1	Ground Radials for WV-1A	UPS	9.95
	M-520A	5 Elements on 20 Mtrs.	TRUCK	209.95
	M-420A	4 Elements on 20 Mtrs.	UPS	139.95
	M-515A	5 Elements on 15 Mtrs.	UPS	119.95
	M-415A	4 Elements on 15 Mtrs.	UPS	79.95
	M-510A	5 Elements on 10 Mtrs.	UPS	84.95
	M-410A	4 Elements on 10 Mtrs.	UPS	64.95
	WM-62A	Mobile Antenna: 5/8 λ on 2, 1/4 λ on 6	UPS	19.95
	M-86	8 Elements on 6 Mtrs.	UPS	84.95
	M-66A	6 Elements on 6 Mtrs.	UPS	54.95
	M-46	4 Elements on 6 Mtrs.	UPS	27.95
	M-112	11 Elements on 2 Mtrs.	UPS	29.95
	M-92	9 Elements on 2 Mtrs.	UPS	24.95
	M-72	7 Elements on 2 Mtrs.	UPS	19.95
		ACCESSORIES		
	HD-73	Alliance Heavy Duty Rotor	UPS	109.95
	RC-8C	8/C Rotor Cable	UPS	.12/ft.
	RG-8U	RG-8U Foam-Ultra Flexible Coaxial Cable. 38 strand center conductor, 11 guage	UPS	.21/ft.

WILSON SYSTEMS TOWERS

Qty.	Model	Description	Shipping	Price
	TT-45A	Freestanding 45' Tubular Tower	TRUCK	$249.95
	RB-45A	Rotating Base for TT-45A w/tilt over feature	TRUCK	139.95
	FB-45A	Fixed Base for TT-45A w/tilt over feature	TRUCK	99.95
	MT-61A	Freestanding 61' Tubular Tower	TRUCK	449.95
	RB-61A	Rotating Base for MT-61A w/tilt over feature	TRUCK	199.95
	FB-61A	Fixed Base for MT-61A w/tilt over feature	TRUCK	129.95

NOTE:
On Coaxial and Rotor Cable, minimum order is 100 ft. and in 50' multiples.
Prices and specifications subject to change without notice.
Ninety Day Limited Warranty, All Products FOB Las Vegas, Nevada
PRICES EFFECTIVE NOV. 1, 1979

Nevada Residents Add Sales Tax

Ship C.O.D. ☐ Check enclosed ☐ Charge to Visa ☐ M/C ☐

Card # _____ Expires _____

Bank # _____ Signature _____

Please Print

Name _____ Phone _____

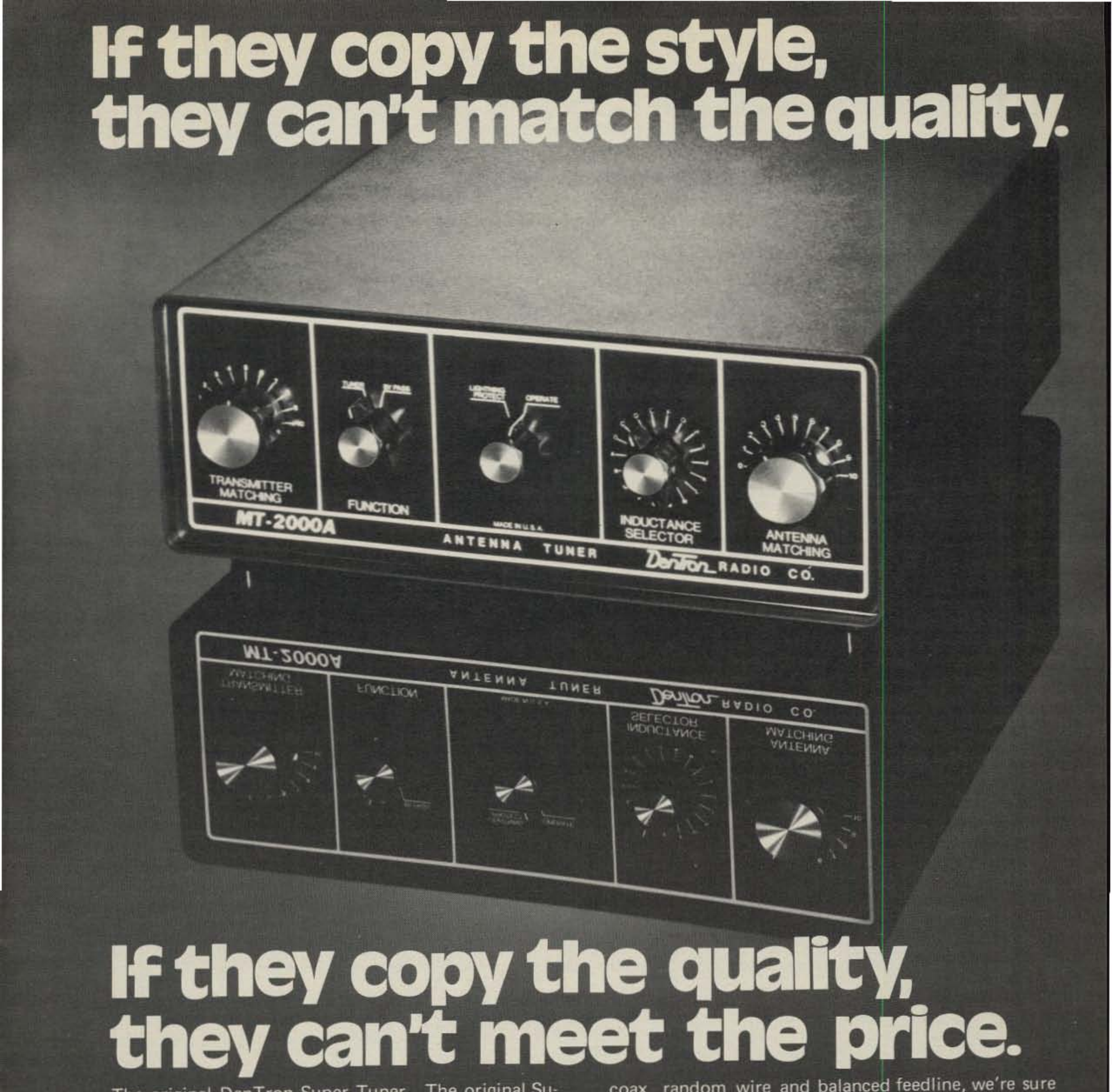
Street _____

City _____ State _____ Zip _____

Prices and specifications subject to change without notice.

CIRCLE 74 ON READER SERVICE CARD

If they copy the style, they can't match the quality.



If they copy the quality, they can't meet the price.

The original DenTron Super Tuner. The original Super Super Tuner. The original MT-3000A. And now DenTron brings you the original MT-2000A, an economical, full-power tuner designed to handle virtually any type of antenna.

The sleek styling and low profile of the MT-2000A is beautiful, but be assured that is only a part of the excitement you'll derive from the MT-2000A. The MT-2000A is designed and engineered using heavy-duty all-metal cabinetry, and high quality American components throughout.

When you consider the MT-2000A's unique features: 5¼"H x 14"D x 14"W, front panel coax bypass switching, front panel lightning protection antenna grounding switch, 3KW PEP, and the ability to match coax, random wire and balanced feedline, we're sure you'll decide to buy an American original and stay with DenTron.

MT-2000A $199.50 at your favorite dealer.

DenTron
Radio Co., Inc.
2100 Enterprise Parkway
Twinsburg, Ohio 44087

216 425-3173

arma
amateur radio manufacturers association

CIRCLE 34 ON READER SERVICE CARD

DSI HAS DONE IT AGAIN

QUIK-KIT II®

INCLUDES PROPORTIONAL OVEN TIME BASE

$149.95

MODEL 5600A KIT

WHY BUY A 5600A: Because 95% of the assembly is completed by DSI and you are only one hour away from solving all those difficult bench problems, from setting the frequency of a audio signal to within 1/10 of a HZ, to checking the frequency of a 486 MHZ mobile radio. Whether you are servicing a VTR, trouble shooting a PLL circuit, the 5600A is the right counter with accuracy that will meet any FCC land mobile, broadcast, or telecommunications requirements. On the bench or in the field the 5600A will do the job you need. The 5600A includes a self contained battery holder providing instant portability or we offer a 10 hour rechargeable battery pack option. Other options include a audio multiplier which allows you to resolve a 1/1000 of a HZ signal and finally a 25db preamplifier with an adjustable attenuator making the 5600A perfect for communications, TV servicing, industrial testing or meeting your QSO on the correct frequency every time.

FACTS ARE FACTS: With the introduction of the 5600A, Thaxton has set on the competition. This may sound like a bold statement on the part of DSI BUT FACTS ARE FACTS. No counter manufacturer except DSI offers a Full Range 50 HZ to 600 MHZ counter with — 8 Digits — 0.1 HZ resolution — 2 PPM 10° to 40° C proportional oven — RF pre-amp — 600 MHZ prescaler — three selectable gate times — oven ready, standby and gate time indicator lights as standard features — For only **$149.95** kit and **$179.95** factory wired. In fact the competition doesn't even come close unless you consider **$200.00** to **$800.00** close. With DSI having the best price to quality features ratio in the industry, no wonder we've become one of the world's largest manufacturers of high quality frequency counter instrumentation.

FOR INFORMATION — DEALER LOCATION — ORDERS — OEM

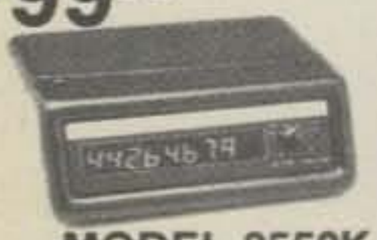
CALL 800-854-2049 CALIFORNIA RESIDENTS CALL 800-542-6253

Model	Price	Frequency Range	Accuracy Over Temperature	Sensitivity @ 100Hz-215MHz	Sensitivity @ 50-215MHz	Sensitivity @ 215-435MHz	Number of Readouts	Size of Readouts	Power Requirements	Size H W D
5600A-K	$149.95	50Hz-600MHz	Proportional Oven 2 PPM 10°-40°C	10MV	10MV	50MV	8	.5 Inch	*115 VAC or 8.2-14.5 VDC	9¼" x 9½" x 9"
5600A-W	$179.95									
3550	99.95	50Hz-550MHz	TCXO 1 PPM 17°-40°C	25MV	25MV	75MV	6	.5 Inch	*115 VAC or 8.2-14.5 VDC	2¼" x 6" x 5"
550HH	$149.95	50Hz-550MHz	TCXO 1 PPM 17°-40°C	35MV	20MV	75MV	8	.4 Inch	*115 VAC or 8.2-14.5 VDC or NICAD PAK	1" x 3½" x 5½"

5600A wired factory tested in 1 year limited warranty. 5600A kit 90 day limited warranty.
Prices and/or specifications subject to change without notice or obligation.

*With AC-9 Adaptor.

$99.95



3550 OWNERS
You can add the 35P.2 .22 PPM 10° to 40° C proportional oven to your existing 3550

T101 Ant.	$3.95
AC-9 AC Adaptor	7.95
35P.2	29.95
Factory Installed	49.95

AMERICAN EXPRESS

DSI INSTRUMENTS, INC.
7924 Ronson Road
San Diego, California 92111

CIRCLE 10 ON READER SERVICE CARD

TERMS: MO - VISA - AE - Check - M.O. - COD in U.S. Funds. Please add 10% to a maximum of $10.00 for shipping, handling and insurance. Orders outside of USA & Canada, please add $25.00 additional to cover air shipment. California residents add 6% Sales Tax.

5600A Kit	$149.95
5600A Wired	179.95
AC-9 AC Adaptor	7.95
T600 BNC Ant.	7.05

BUILT-IN OPTIONS

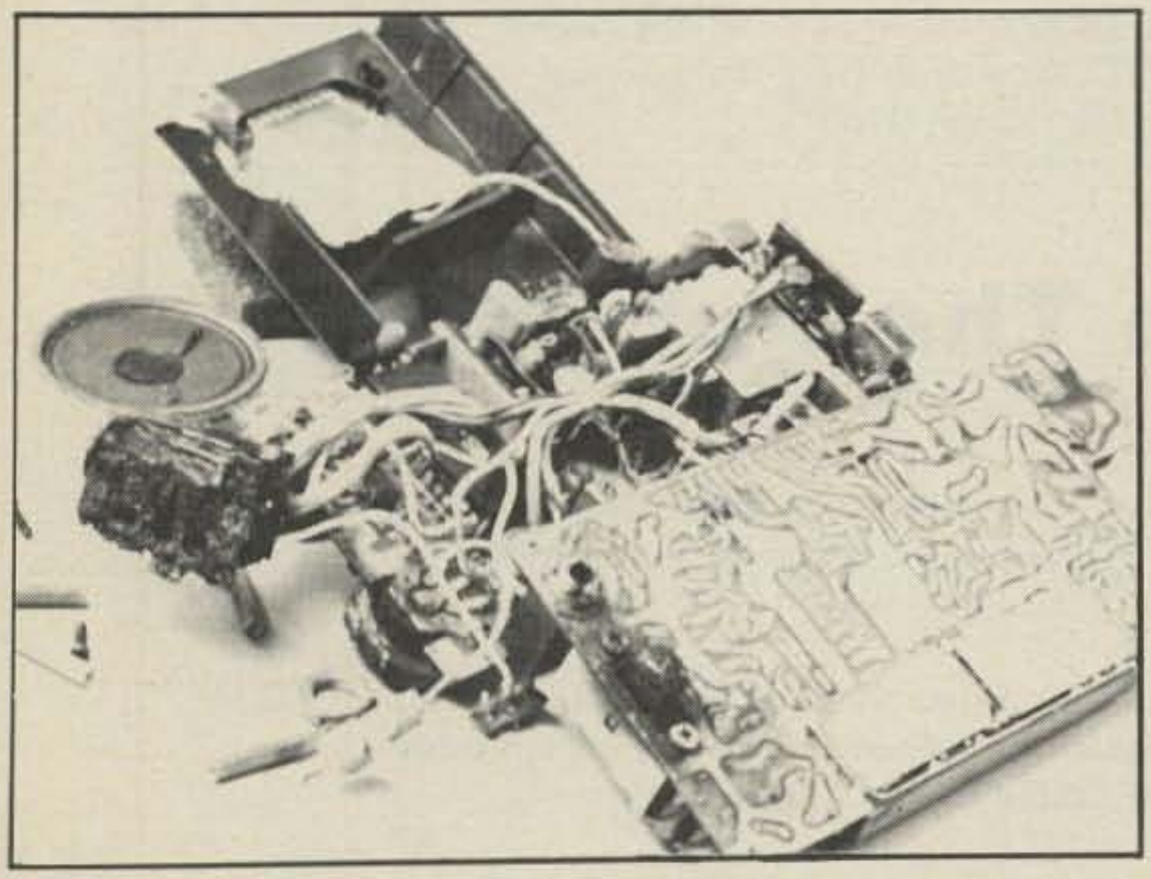
BA56 Rechargeable 10 Hr. Bat. Pack	24.95
AM56 Audio Multiplier .001Hz Resolution	34.95
PA56 25dB Preamplifier with Attenuator	59.95

*Shown with accessory touch tone pad

PROVEN DEPENDABILITY

...THE TEMPO S-1 KEEPS WORKING WHEN THE GOING GETS TOUGH

By now most of you have heard the same words of praise on the air that we (gratefully) receive over and over. The quality that is built into the S-1 has been attested to by the outstanding performance and dependability of the thousands of units in daily use. The high level of innovative engineering that brought forth the Amateur world's first hand held synthesized radio also designed into this compact beauty exciting performance and features at a very affordable price. A price that also includes a ni-cad battery pack, charger, and a telescoping whip antenna. The optional touchtone pad shown in the illustration adds greatly to its convenience. In addition we offer superior quality 30 and 80 watt solid state matching power amplifiers that give the S-1 the flexibility of operating as a portable, mobile, or base station rig. Remember...the Tempo S-1 is the original and proven 800 channel synthesized hand held transceiver. Don't be fooled by substitutes.



This S-1 was in a motorhome that was totally destroyed by fire. When the owner probed around in the ashes he found his S-1, burned almost beyond recognition. BUT STILL OPERATING. Since then we cleaned it up, replaced the case and controls, tuned it, and now it's back on the air...as good as new.

The Tempo line also features a fine line of extremely compact UHF and VHF pocket receivers. They're low priced, dependable, and available with CTCSS and 2-tone decoders. The Tempo FMT-2 & FMT-42 (UHF) provide excellent mobile communication and features a remote control head for hide-away mounting.
The Tempo FMH-42 (UHF) and the *NEW* FMH-12 and FMH-15 (VHF) micro hand held transceivers provide 6 channel capability, dependability plus many worthwhile features at a low price. FCC type accepted models also available.
Please call or write for complete information. Also available from Tempo dealers throughout the U.S. and abroad.

SPECIFICATIONS

Frequency Coverage:	144 to 148 MHz
Channel Spacing:	Receive every 5 kHz, transmit Simplex or ±600 kHz
Power Requirements:	9.6 VDC
Current Drain:	17 ma-standby 500 ma-transmit
Batteries:	8 cell ni-cad pack included
Antenna Impedance:	50 ohms
Dimensions:	40 mm x 62 mm x 165 mm (1.6" x 2.5" x 6.5")
RF Output:	Better than 1.5 watts
Sensitivity:	Better than .5 microvolts

Price... $349.00
With touch tone pad... $399.00

SUPPLIED ACCESSORIES
Telescoping whip antenna, ni-cad battery pack, charger.

OPTIONAL ACCESSORIES
Touch tone pad (not installed): $39 • Tone burst generator: $29.95 • CTCSS sub-audible tone control: $29.95 • Rubber flex antenna: $8 • Leather holster: $16 • Cigarette lighter plug mobile charging unit: $6 • Matching 30 watt output 13.8 VDC power amplifier (S30): $89 • Matching 80 watt output power amplifier (S80): $149

NEW TOLL FREE ORDER NUMBER: (800) 421-6631
For all states except California.
Calif. residents please call collect on our regular numbers.

11240 W. Olympic Blvd., Los Angeles, Calif. 90064 213/477-6701
931 N. Euclid, Anaheim, Calif. 92801 714/772-9200
Butler, Missouri 64730 816/679-3127

Henry Radio

Prices subject to change without notice.

CIRCLE 31 ON READER SERVICE CARD

No-19-20

Announcing

• **Framingham, MA** — On Sunday, November 11, 1979, the Framingham Area Radio Association will hold an Indoor Electronic Flea Market. The location will be at the Framingham Police Drill Shed behind the Police Station. From Rt. 9, take Rt. 126 south to the center of Framingham. Sellers set-up from 9 a.m. to 10 a.m. The doors will be open from 10 a.m. to about 2 p.m. Advance table reservations will be $5. and if any tables are available at the door, the cost will be $7.50 (almost none last time). Talk-in will be on 75-15 and 52 direct. Refreshments will be available outside the flea-market area. Information on reservations via: Framingham Area Radio Assoc., P.O. Box 3005, Framingham, MA.

• **Columbia, MD** — The Columbia Amateur Radio Association will hold its 3rd Annual Hamfest at the Ellicott City National Guard Armory (just east of Rt. 29 on Rt. 103) on Sunday, November 25, 1979. Doors will open at 6 a.m. for exhibitors and 8 a.m. for general admission. Admission is $2.00, tables-$5.00. No tailgating. Food will be available. Prizes. Talk-in on 147.735/135; 146.16/76; and 146.52/52. For table reservations and information, write: Sue Crawford, N3SC, 6880 Mink Hollow Rd., Highland, MD 20777.

• **Columbus, OH** — The 20th Annual CQ-WE Contest, sponsored by Bell Lab's and Western Electric ARC, will be held on November 10-11, 1979. This year's contest is open to all Bell System employees/retirees and includes Western Electric, Bell Labs, AT&T Co., AT&T Long Lines and Bell System Operating Companies. The contest will run from 1900-0500 UTC on Nov. 10th and 11th with a break at 2300-0000 UTC. Nov. 10th - 1900-2000 UTC: Novice & HF Tech; 2000-2300 UTC: CW; 0100-0400 UTC: Phone; 0400-0500 UTC: All Modes. Nov. 11th - 1900-2200 UTC: Phone; 2200-2300 UTC: All Modes; 0100-0200 UTC: Novice & HF Tech; 0200-0500 UTC: CW. All Amateur Radio Bands, CW, Phone, RTTY and TV. Logs to be submitted to Local Co-ordinator by Dec. 3rd. Certificates and Plaques to be awarded. For more complete contest details and rules, contact your Local Coordinator or send SASE to Host Chairman: Ed Kolalski, Bell-Labs-RM-1K227, 6200 E. Broad St., Columbus, OH 43213.

• **Vienna, VA** — The Vienna Wireless Society, Inc., has been awarded a registered trademark for "Winterfest" by the U.S. Patents and Trademarks Office. This trademark will be in effect for 20 years and thus assures the VWS of the use of this logo for its Hamfest held annually in February.

A Message From The Publisher

Goodby! This will be the last issue of CQ published by Cowan Publishing Corp., and the last on which I serve as publisher. As this issue goes to press, CQ is in the process of being purchased by a brand new publisher.

Actually, the new publisher is familiar to most of you. Dick Ross, K2MGA has served as editor of CQ in the past, and as Assistant Publisher for the past few years. He's been able to put together his own publishing company and has made us an offer for CQ that we simply couldn't refuse.

I've really enjoyed publishing CQ the past 21 years. It's been a challenge with many frustrations and many joys. To be honest, my interest in Amateur Radio as a hobby should drastically increase, now that I won't have to think of it as a business anymore. From that angle, I'm looking to spend a lot more time on the air, renewing old acquaintances and making new ones.

Ham Radio is a great hobby. It's a hobby that should continue to grow in the years ahead. Perhaps with some better leadership at the organization level it will grow faster than in the past; time will tell.

To Dick, Al Dorhoffer and the rest of the CQ staff I wish only the best for the years ahead. To my friends in the industry, don't worry; I intend to keep in touch to keep my pulse on what's happening in the hobby.

One last thought. A few years ago I personally made a commitment to rebuild CQ in size and quality. As I look over the issues for the past year or so I feel that I've lived up to that promise. CQ is in good shape and in good hands. With that accomplished I can say farewell with a good feeling.

Richard A. Cowan, WA2LRO

New from NRI! 25" DIAGONAL color TV that tunes by computer, programs an entire evening's entertainment.

Just part of NRI's training in servicing TV, stereo systems, video tape and disc players, car and portable radios.

Only NRI home training prepares you so thoroughly for the next great leap forward in TV and audio…digital systems. Already, top-of-the-line TV's feature digital tuning, computer programming is appearing, and new digital audio recording equipment is about to go on the market.

NRI is the only home study school to give you the actual "hands-on" training you need to handle servicing problems on tomorrow's electronic equipment. Because only NRI includes this designed-for-learning, 25" diagonal color TV with electronic tuning, built-in digital clock, and computer programmer as part of your training. With this advanced feature, you can pre-program an entire evening's entertainment.

Designed-for-learning Concept

The color TV you build as part of NRI's Master Course looks, operates, and performs like the very finest commercial sets. But behind that pretty picture is a unique designed-for-learning chassis. As you assemble it, you perform meaningful experiments. You even introduce defects, troubleshoot and correct them as you would in actual practice. And you end up with a magnificent, big-picture TV.

Build Stereo, Test Instruments

That's just a start. You demonstrate basic principles on the unique NRI Discovery Lab®, then apply them as you assemble a fine AM/FM stereo, complete with speakers. You also learn as you build your own test instruments, including a 5" triggered sweep oscilloscope, CMOS digital frequency counter, color bar generator, and transistorized volt-ohm meter. Use them for learning, use them for earning as a full or part-time technician.

Even Includes Video Systems

You need no previous experience of any kind. Starting with the basics, exclusive "bite-size" lessons cover subjects thoroughly, clearly, and concisely. "Hands-on" experiments reinforce theory for better comprehension and retention. And your personal NRI instructor is always available for advice and help. You'll be prepared to work with stereo systems, car radios, record and tape players, transistor radios, short-wave receivers, PA systems, musical instrument amplifiers, electronic TV games, even video tape recorders and tape or disc video playbacks.

Send for Free Detailed Catalog, No Salesman Will Call

Mail the coupon today for our free 100-page catalog with photos of all kits and equipment, lesson plans, convenient time payment plans, and information on other courses. You'll also find out about NRI's new Computer Technology Course that includes your personal microcomputer. Or Complete Communications with 2-meter transceiver. If coupon has been removed, write to: NRI Schools, 3939 Wisconsin Avenue, Washington, D.C. 20016.

NRI Schools
McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue
Washington, D.C. 20016

Please check for one free catalog only.
NO SALESMAN WILL CALL

All career courses approved under GI Bill.
☐ Check for details.

- ☐ TV/Audio/Video Systems Servicing
- ☐ Complete Communications Electronics with CB • FCC Licenses • Aircraft, Mobile, Marine Electronics
- ☐ CB Specialists Course
- ☐ Amateur Radio • Basic and Advanced
- ☐ Computer Electronics Including Microcomputers
- ☐ Digital Electronics • Electronic Technology • Basic Electronics
- ☐ Small Engine Repair
- ☐ Electrical Appliance Servicing
- ☐ Automotive Mechanics
- ☐ Auto Air Conditioning
- ☐ Air Conditioning, Refrigeration, & Heating Including Solar Technology

Name (Please Print) Age

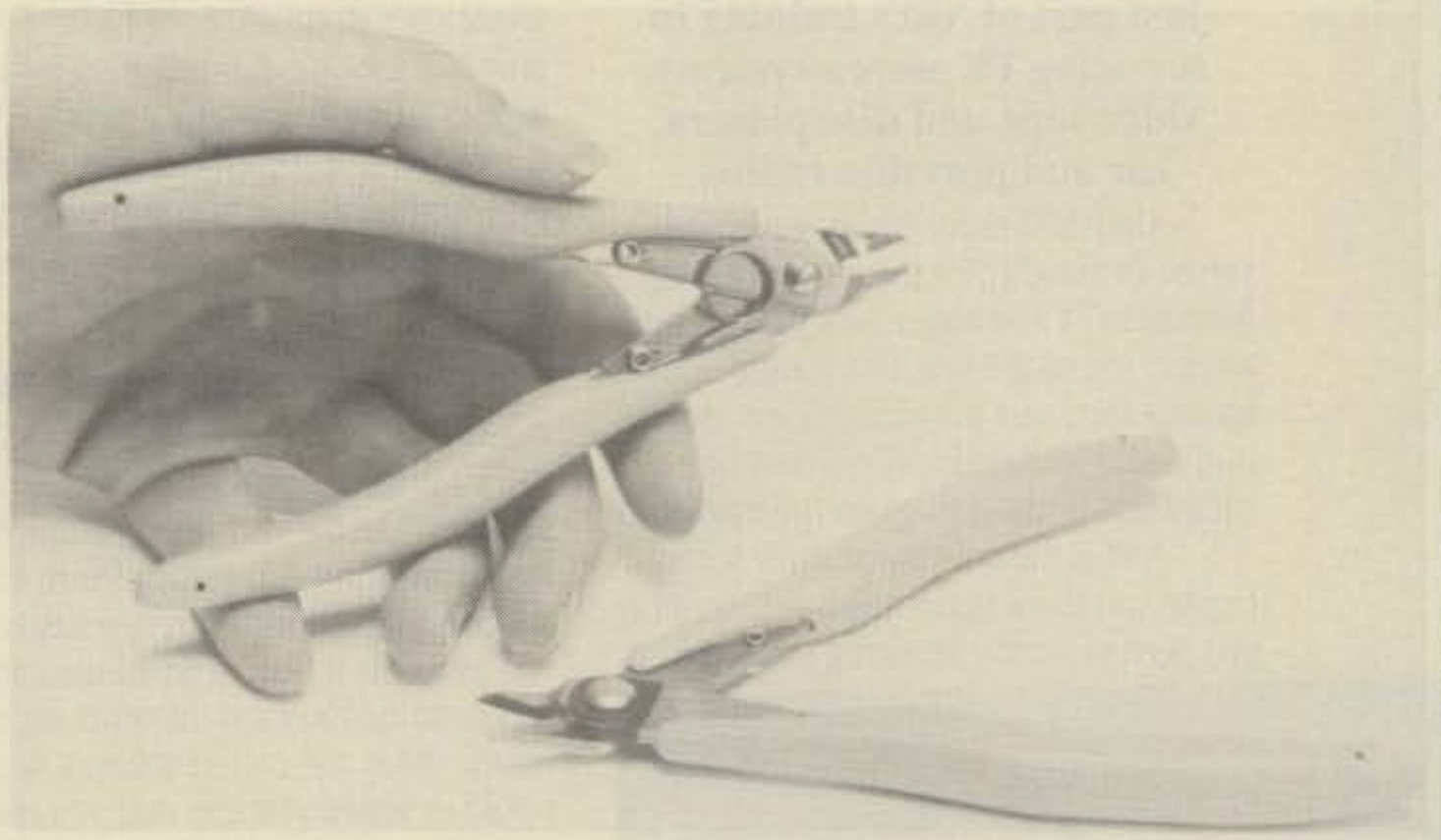
Street

City/State/Zip

Accredited by the Accrediting Commission of the National Home Study Council 5-119

CQ Showcase

Electronic Production Equipment Corporation Electrical Lead Flushcutters



The EPE Super-Shear™ Series of electrical lead flushcutters features a unique blade bypass that creates a shearing action for cleaning and easy cutting with reduced dulling. Suitable for cutting hard materials such as Kovar and Dumet, they are made of specially heat treated, high carbon tool steel. The first tools in this series include the standard cutters Model 007, and Model 007S with safety clip to retain cut off leads. Supplied with a highly polished, corrosion-resistant, plated finish, the EPE Super-Shear™ Series incorporates a return spring guaranteed for the life of the tool. Weighing only 1.5 oz., the 5" long shears are fitted with replaceable, insulated cushion grip handles. The EPE Super-Shear™ Series is priced at $8 each for the Model 007, and $9.50 each for the Model 007S, For more information contact: Electronic Production Equipment Corporation, P.O. Box 5238, Grenier Industrial Village, Manchester, NH 03108 or circle 86 on the reader service coupon.

Digitrex 7600 Portable Frequency Counter

Digitrex is offering their 7600 portable frequency counter to the marketplace. The unit will measure from approx. 2 MHz to 600 MHz, and provisions are made for external connections to your own frequency amplifier (TTL level output) to measure low frequency signals more accurately. The 7600 uses LSI circuitry and has 1.0 second gate time: 100HZ and 0.1 second gate time: 1kHz. The input impedence is 50 ohms and the maximum input voltage is 2 volts. The 7600 measures 5 × 3 × 1½ inches and sells for $59.95. For complete information including accessories write to Digitrex, 1005 Bloomer, Rochester, Michigan 48063 or circle 88 on the reader service coupon.

Chemtronics Electrical Contact Cleaner

Chemtronics introduces Kontact Clean® and Kontact Restorer® . Kontact Clean is an instant non-residue cleaner for all types of contacts, switches and controls. It is chemically pure and restores electrical and mechanical continuity. It is safe for painted and plated surfaces and may even be applied to equipment in operation. The 6 oz. can sells for $1.39 and the 16 oz. size is $2.30. Kontact Restorer cleans by penetrating surface pores and disolving grease, dirt and oxidation, and then protects sprayed surfaces by leaving a long-lasting film of high-grade lubricant. For more information write to Chemtronics Inc., 681 Old Willets Path, Hauppauge, N.Y. 11787 or circle 90 on the reader service coupon.

Wilson...

has your needs well in hand.

Today's Amateur demands rugged, rapid and accurate communications between Hams in the know. That's why they choose the Wilson Mark Series of hand-held radios. With exceptional qualities like these . . . why not choose the most popular radio available for yourself?

FEATURES

Advantages such as solid state circuitry, rugged Lexan® case, removable rear panel (enabling easy access to battery compartment) and compact mini-size enhance the Mark Series portable radio's versatility. In addition, Wilson carries a full line of accessories to satisfy almost any of your requirements.

SPECIFICATIONS

The Mark radios offer: • 144-148 MHz range • 6 Channel operation • Individual trimmers on TX and RX xtals • Rugged Lexan® outer case • Current drain: RX; 15 mA, TX; Mark II: 500 mA, Mark IV: 900 mA • A power saving Hi/Lo Switch • 12 KHz ceramic filter and 10.7 monolithic filter included • 10.7 MHz and 455 KHz IF • Spurious and harmonics, more than 50 dB below quieting • Uses special rechargeable Ni-Cad battery pack • LED battery condition indicator • Rubber duck and one pair Xtals 52/52 included • Weight: 19 oz. including batteries • Size: 6" x 1.770" x 2.440".

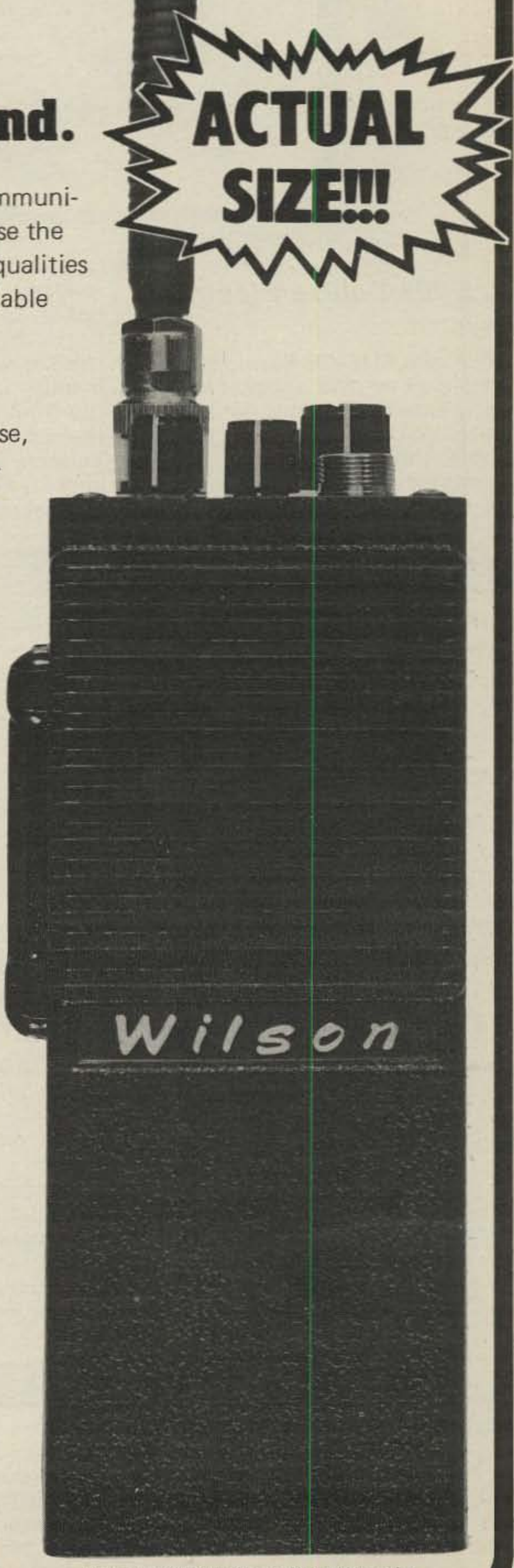
OPTIONS

Options available, include Touch Tone Pad, CTCSS, Leather Case, Chargers for Desk Top, Travel or Automobile, Speaker Mike and large capacity, small size batteries.

For more details and/or the name of your nearest dealer, contact: Consumer Products Division, Wilson Electronics Incorporated, 4288 So. Polaris Ave., P. O. Box 19000, Las Vegas, Nevada 89119. Phone 702/739-1931.

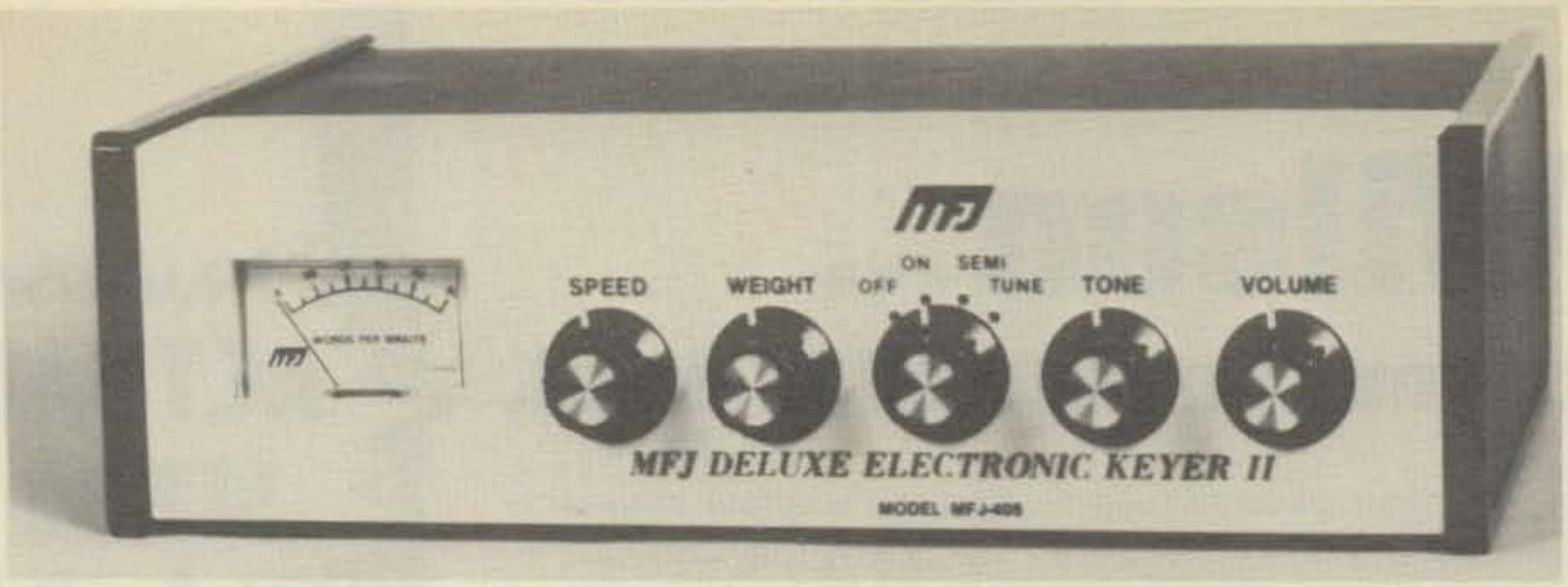
Wilson Electronics Incorporated

A Subsidiary of REGENCY ELECTRONICS, INC.



Prices and specifications subject to change without notice.

CIRCLE 53 ON READER SERVICE CARD

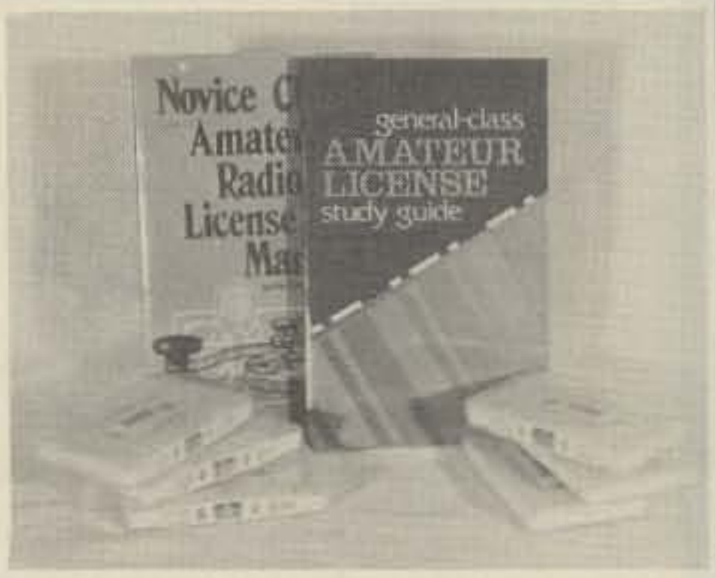


MJF-408 Deluxe Electronic Keyer II

MJF's new MJF-408 keyer features a readout meter plus a socket for using Curtis external memory, random code generator, and keyboard. This will enable the user to read sending speeds up to 50 w.p.m. plus use all of the Curtis accessories (which are available as accessory PC boards or boxes. The keyer is based around the Curtis 8044IC keyer chip and sends lambic, automatic, semi-automatic or manual. All operating controls are on the front panel with phone jacks on the rear. The MJF-408 is completely portable and will operate up to one year on 4 c-cell batteries. The cabinet is eggshell white with walnut sides and its size is 8 × 2 × 6 inches. The keyer is prices at $79.95 (plus $3.00 shipping and handling). An accessory cable and plug is priced at $3.00. An optional a.c. adapter is available for $7.95. For complete specifications write to MFJ Enterprises, P.O. Box 494, Mississippi State, MS 39762 or circle 84 on the reader service coupon.

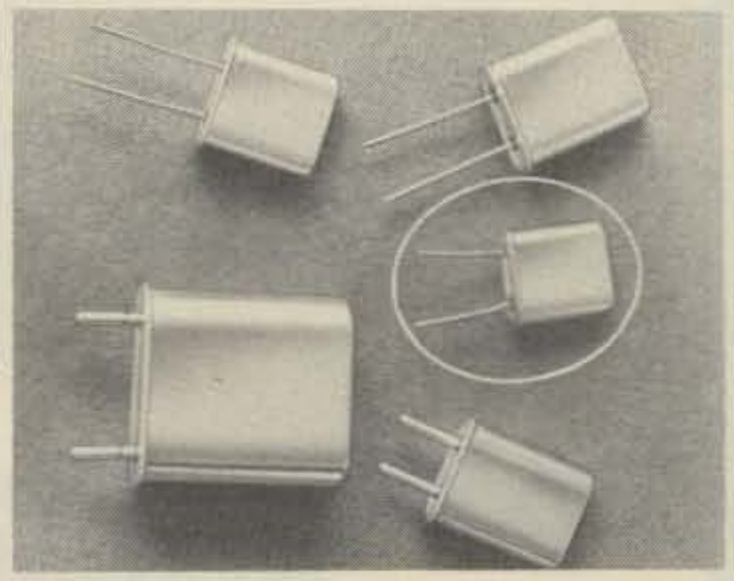
Kantronic's General Combo

Kantronic's is offering an organized package for the amateur or prospective amateur who wishes to upgrade their license. The course is based around the *General-Class Amateur License Study Guide* (written by Phil Anderson, W0XI of Kantronics) put out by Sams Publishing. The book provides not only memorizable information for the exam but also considerable information that is practical and usable on electronics. It is complete with sample exams. General Cassette Tapes accompany the book which discuss rules, regulations and theory in an interview format. A QSO Tape is also supplied which simulates exam-like "on the air" code transmissions. The tape progresses from 7½ to 15 w.p.m. The Combo price is $19.95. For complete details write to: Kantronics Inc., 1202 E 23rd St., Lawrence, Kansas, 66044.



Radio Publications Wall Chart

Radio Publications is producing a full color wall chart called the "Worldwide Listeners Guide to the Radio Spectrum." Over 500 listings span the chart which covers from 10 kHz to 30 GHz with specific listings of stations found on particular frequencies. The chart measures 35″ × 25″. There's plenty of information laid out in an attractive manner, resembling the rainbow spectrum. The chart is mailed in a tube and sells for $4.50 ppd. For more information write to Radio Publications Co., P.O. Box 28, Lake Geneva, WI 53147 or circle 87 on the reader service coupon.



Standard Communication's Micro-Miniature Crystals

A new micro-minature crystal, approximately ⅓ smaller than the commonly used HC-25/U, is now available from the Frequency Management Division of Standard Communication Corp. in Carson, California. The crystal is fabricated using a unique welding technique which eliminates the possibility of contamination from solder and flux. It measures .360″ high, .365″ wide and .134″ thick. For further information write: Standard Communications, Frequency Management Division, P.O. Box 92151, Los Angeles Ca. 90009 or circle 85 on the reader service coupon.

Cincinnati Electrosystems

Cincinnati Electrosystems has brought out another in its "Black Box" series of test equipment. This unit is a Decade Resistance Box and provides accurate (1% from 10 ohms to 1,111,000 ohms and 0.1% at 100 ohms, 1 kilohm, 10 kilohm, and 100 kilohms) resistance values in 10 ohm steps from 10 ohms to 1,111,000 ohms. It is a small compact and easy to use. The Box sells for $36.45. For more information write to Cincinnati Electrosystems Inc., 469 Ward's Corner Rd., Loveland, Ohio 45140 or circle 83 on the reader service coupon.

Wilson Mini-Com Batteries

JaBro Batteries is now a second source of batteries used to power the Wilson Mini-Com radio. The rechargeable, sealed, nickel-cadmium battery is their catalog number J/BP4, and is a 11.25 volt 500 MAH power pack. For further information and a copy of their catalog write to JaBro Batteries, Inc., 5005 Chase Drive, Downers Grove, Illinois 60515 or circle 82 on the reader service coupon.

Rainbow Computing has a 45 page catalog on what they say is the largest collection of software for the Apple Computer including all sorts of accessories and peripherals. To get your copy write to Rainbow at 9719 Reseda Blvd., Northridge CA 91324 or circle 76 on the reader service card.

Maurey Instrument is offering a free catalog of precision potentiometers including conductive plastic and wirewound precision potentiometers. There are single turn, ½" to 3" diameter units in bushing and servo mounting. Included are linear motion potentiometer/transducers from 1' to 36" strokes. Minature and heavy industrial types are also listed. For a copy write to: Maurey Instrument Corp., Engineering Manual EM709, 4555 W. 60th St., Chicago, IL 60629 or circle 91 on the reader service coupon.

Katalog Korner

Hustler Inc. is offering a 22 page minicatalog on all of their amateur antennas from 80 meters through 435 MHz. For a free copy write to Sales Dept., Hustler Inc., 3275 North B Ave., Kissimmee, FL 32741 or circle 75 on the reader service card.

Phelps Dodge has two new catalog sheets describing their miniature 4 and 6 cavity series of Miniplexer™ v.h.f. and u.h.f. duplexers. The units are designed for 144 to 174 MHz and 406 to 470 MHz bands. For free copies write: Miniplexer, Phelps Dodge Communications Company, Route 79, Marlboro, NJ 07746 or circle 77 on the reader service coupon.

In case you missed it, you can still send for a copy of Continental Specialties Corporation's 32 page catalog of test equipment and breadboards. hardware and case. You will also note that some of their prices have even been lowered. For your copy write to: Continental Specialities Corporation, 70 Fulton Terrace, New Haven, CT 06509 or circle 80 on the reader service coupon.

Unadilla/Reyco is offering their PC-80 Antenna Accessories Catalog which features over 72 antenna products for amateur, CB, and home TV innovators, included are baluns, traps, insulators, invisible antennas, filters and hook-up hardware. Write for your copy to: Unadilla/Reyco Division, Microwave Filter Co. Inc., 6743 Kinne St., East Syracuse, N.Y. 13057 or circle 78 on the reader service card.

Heathkit has a new 96 page catalog describing nearly 400 electronic kits that you can build. The new catalog offers several new items of test equipment, computers and add-ons, remote antenna switch for five amateur antennas and some additional pieces of audio equipment. To get your copy, write to Heath Company, Dept. 350-880, Benton Harbor, Michigan 49022 or circle 79 on the reader service coupon.

MFJ Enterprises is now shipping their 1980 catalog of amateur products. This new catalog has 12 pages of pictures, descriptions, specifications and prices for MFJ products. The catalog is available by writing MFJ Enterprises, P.O. Box 494, Mississippi State, MS 39762 or circle 81 on the reader service coupon.

Contesting (CQ World Wide Style) From ZL3/C.

That Chatham Gang

Part II

BY JAN GOULD*, WA6YQW, ex-ZL3HI/C

In August we presented Part I of Jan Gould's story of the Chatham Island DXpedition. We left off where (in the best tradition of movie "cliff hangers") the remaining six members of the team were to be airlifted from Wellington in Auckland to their temporary home on Chatham. Part II takes up the story where we left off and brings it to a happy conclusion. —Ed.

Show On A Watery Road

The Bristol 180, fondly referred to as "The Bristol Vibrator" was deemed by some local pundit to be "10,000 rivets flying in loose formation!" Resembling a miniature version of the US "Pregnant Guppy," originally a twin fuselage cargo amphib that landed on the Te Whanga lagoon, it has now been replaced by a more modern single-tail hull that uses a large grassy field for landing. Good weather on the island as well as the mainland for 8 hours prior to flight time is mandatory or the twice-weekly run is grounded, so having to sweat out that aspect is a distinct possibility. The fecund profile of the plane is not unique. What is amazing is that it literally and figuratively comes apart before your eyes. Gutted, a boxcar-without-wheels passenger compartment is inserted through the huge gaping nosecone, and cargo stuffed fore and aft. What is one's feeling about this nuts and bolts panoply? What reactions while gazing through holes in the deck of the aft section that houses the one and only "john"; you can see the ocean just a few thousand feet below. A couple of things come to mind: #1, it's so cold and drafty it discourages lingering in that are very long, and #2, you're darn glad that you were warned to bring earplugs, because the roar of the twin engines is virtually deafening during most of the 4½ hour flight. You are, however, made as comfortable as is possible on a ship that is designed more for freight than people. Accomodating 14 to 20, depending upon the weight of the other payload, there is a purser in attendance to serve hot drinks, prewrapped sandwiches and fresh fruit and it's quite pleasant. The flight, both ways, was extremely smooth and far more comfortable than we had been lead to expect. There is one point at which you then to hold your breath, but that takes place prior to takeoff, at which time passengers are weighed physically with their carryon luggage...in our case, some pretty hefty gear that had to go last. It's a situation where the smallest and lightest are depended upon to the weigh in with the heaviest articles, hopefully balancing out your total allotment. Over 400 kilos of equipment had been sent on ahead several weeks earlier.

*1542 Beacon Ave., Anaheim CA 92802

To B-rrr Or Not To B-rrr

An onslaught of icy wind meets you when the plane's doors open and it's a portent of things to come. Dreary and overcast, not much could be seen from the air. Fog and cloud banks obscured most everything on the ground except the blobs of grey and russet that finger out into the largest lagoon. The nosecone opened out and forklifts removed the cargo on pallets. 4NF and the RI were there to greet us, with a little needling about the rest of us not being dressed warmly enough. A village bus was waiting to haul us and the gear to Waitangi, driving through sparse wind-tortured forests and giving us an intermittent glimpse of the rougher topography. Past smaller lagoons and

ZL3HI/C. Have bags, will travel.

inland waterways, to marvel at the tremendous flocks of black swans, thousands of them, frequently game bird with special local hunting permits. An occasional darting weka, the native bird, with it's absurd staggering and leaping that causes you to wonder if perhaps it doesn't have lineage somewhere between the Roadrunner and a Rhode Island Red...sort of a Chicken Little sky-falling-down mentality. Bonkers!

Home, Sweet, Huh?

Bed and board at the Hotel Chatham cannot be construed with a two week vacation on the Strip in Las Vegas! The miniscule rooms scarcely permitted freedom of movement. A small strip hot water heater is on one far wall but under no circumstances does it provide a heated room. The mattresses were concave, and as we learned later, that depression was a convenient place to put your hot water bottle when you tried to thaw out and get warm enough to sleep a few hours. It is only tenant-managed, and somewhat grimly because they have been waiting months to be relieved of that duty by the actual owners who live somewhere on the comfortable mainland. Through no fault of the beleagured managers, the hotel is in a pitiful state of clapboard deterioration, in need of work, replacements and general refurbishing. Plumbing, which refused to give hot water after sundown...or did the butler do it? Poor wiring, and outmoded coal burning range in the kitchen. It is kept clean, but still leaves a lot to be desired from the standpoint of a commercial enterprise. The building sets but a few yards from the ocean's edge and has suffered years of apathy and neglect.

Only a fellow amateur can comprehend our lack of concern, at that particular moment, for regimented eating and it was difficult explaining to the proprietors that keeping their meal skeds in line with our planned operating sked was going to be difficult, particularly when 0430 GMT is definitely not the time to walk away from a contest. The food was well prepared, a good variety with portions often begging to be shared to two. Just the incessant annoyance of trying to placate when you really didn't want to be bothered with a sitdown meal. Their solicitous approach was generous to a point but, nonetheless, a source of tension.

The day before the *CQ* 'test, we took the rented Landrover out to the

operating site, past acres of a flowering shrub called "gorse." "Gross" would have been more *appropos*. One look at the dense tangle of thorns that lay hiding in those bright yellow blossoms and you understood why. Ditto the pretty heather purple of the local thistle, as one who shall remain nameless learned when he sat in a clump of it while working on a trapped vertical.

Chuck had precut, assembled and pretested the beam, dipoles and delta loop before shipping them, and worked out a slick method for erecting the TH3 Junior, which proved to be feasible for one sturdy person to handle, if need be. Everything had to be reassembled on the site, but the preliminary work had ironed out most of the bugs. Good friend Bill, VK2DJ, had engineered and donated the thrust bearings for the maining beam and they were everything we had hoped they'd be. Only the WX makes upending antennas a real chore. More winds and driving rain, a piercing cold we grew to know and dread...the kind of cold that never lets the numbness leave your hands...that makes sending readable c.w. difficult even for the old pro...cold that causes you to crumple your fingers around the pencil and still not be able to write legibly. Later, we would resort to two and three sweaters each and swaddling in blankets and burlap bags on the floor of the shed in a futile attempt to halt the cold's hampering effects. After losing one fleece-lined glove, in desperation I slit open a sock and sewed it into a makeshift mitten.

By evening of the 27th all was in place and we were operative on the contest site. Having vowed that ZL3HI/C would remain a secret

The famous Chatham Island lily. The tiny blossoms are dwarfed by the huge foliage. If those are hops, it must be the water.

ZL1ADI. The gloved left hand was getting preferential treatment. It was 0°C.

Loralie, cloaked in mystery until the opening minute of the contest, there we grouped in a little shed, 1ADI seated in front of the rig set on 20 meters. Maybe we should just key up once for a fast signal report. No! Oh, no! Not until the contest. Not until the 28th! Not until...After much mulling and facts and mumbling, it was decided that just one quick signal report was definitely in order to check out the band condx, etc. Right? Wrong! Most stories, fact or fiction, have an uproarious anecdote. Ours is no exception. Classic props: our little band gathered in silence, all gazing at the FT-101 EE, not daring to breathe, cough or sneeze. Our fearless leader poised for the momentous event. ZL3HI/C calling "CQ from the Chatham Islands." The response shall never be forgotten. Earthshaking ..traumatic..and utterly hilarious. Our first contact was stateside and the recipient was a little into his weekend sauce. All we heard was a slightly sheepish: "Shorry ole men...if ur freekenshy is busy I'll be happy to move off." No, you don't understand. This is the Chatham Island DXpedition. You're the first contact...moment in history and all that jazz. Again: "Thash okay ole man, happy to clear ur freekenshy." Did he realize what a *coup d'etat* that was? Stunned, laughing and with slightly bruised egos, we secured the station and returned to the hotel for hot food, cold room and lumpy mattresses.

CQ Contest, CQ Contest

Everyone at their assigned rig for the opening, with any spare or unused ear floating somewhere near the one set for 160 monitoring, with the normal amount of pre-contest enthusiam and a special touch of excitement. All of the team members were pretty "rabid" contestors and were looking ahead with some lofty aims and goals. Nursing a special kind of glee at being "The DX" for a change, we waded pileups and reveled in creating them. No one ever tells the truth about contest scores; it's either stretched to unreality or played down into meaningless small figures. We began hearing about KH6XX and the gangbuster rate at which his giant crew was running, maybe a little envious, but not without just and honest appraisal. Where were those elusive multipliers? That proved to be our weak spot in the final analysis. We didn't take the Oceania Division, but our international standing in the scoring should be creditable. The net figures remain about where Chuck had figured they would be, even after pulling dupes. We love ya, friends, but why, oh why did some of you work us ten and twelve times on the same band? We had hoped that using one call sign would eliminate the probability of the overzealous working each individual operator. Not so!

Second day windup and try to rejuggle the skeds to coincide with the eating habits of the denizens of Hotel Chatham, which would be a daily hassle. Someone worrying about being there on time for meals, or fretting over the possibility of missing one, or cringing at the prospect of having to tell the manager, once again, that the sked's been changed and one or more of our bodies would be conspicuously absent. *Ad nauseum.*

During the ensuing week the winds picked up to unbelievable strenght. The RI reported something near 60 knots and the temperature must have dropped well below 0° C. You can compute that chill factor. About 1000 GMT one night Chuck hailed the YLs, now in another shed, that it was too cold to continue operating. Fingers nearly frozen and Nature's regrigeration penetrating the blankets we'd wrapped around us, and some special though being given to the delta loop which was flailing it's monsterous head like some angry behemoth. To heck with the delta loop...if it goes, it goes. We had to get out of than cold! "The Boss" secured Shed #1, we shut down #2 and one of the caravans being used and went back to the hotel, only to find that, once again, the hot water had been cut off and there was no possible way of getting a tub or shower to abet our "thawing" process. Back to the hot water bottle routine, filled with water that had been purloined from the kitchen tank, and into the yawning canyons that masqueraded as mattresses.

Odds, Ends, Brickbats and Bouquets

We had relocated, somewhat, after the *CQ* WW, using two areas donated by 3NR/C and the resident school teacher and his wife. The couples not only permitted us the use of their property, but kindly supplied us hot drinks and snacks during the long chilly nights. Brian's house is adjacent to the commercial radiostation and is crisscrossed with high voltage lines and 30 miles of antenna wires. This diminished the performance of the delta loop but we're not writing that antenna off. Located in a more optimum spot, it may have been very effective. There was minimal r.f.i. problems, some spurring from 15 meters into the commercial station, which is use primarily for WX and shipping data and information. This was corrected and the complaints had tapered off after the *CQ* 48 hour talkathon.

The Minooka Special performed well, though there wasn't the volume we would like to have seen on 160. Slopers were about par, as were the other dipoles. The TH3 Jr., with the functional thrust bearings was great on 10, 15 and 20 and withstood the gales. It was hooked up to one of the FT-101EEs and the FL-2100B amplifier. 4NF's homebrew linear was given the last rites early in the game. A second 101-EE tailed the trapped vertical and was used frequently on 160. Minor diodes and resistors smoked in the 2100B towards the end of the trip. The 101s held well and had reasonably good output the entire time. A Kenwood 901 required replacement of the finals and the Drake TR4C had a minor malady, but

with so many different people handling the various rigs, it's not surprising. Maybe there's something to be said for the old adage about radios having the soul of a personal fountain pen. They work best for the individual owner. Full breakin c.w. was neat on the TenTecs while they were in use, lack of vox somewhat inconvenient. Several Shure 444 mikes were taken, however one of the rigs was run with no vox and a handheld mike that required switching over on each xmission, a slightly delaying procedure. WD6CUN, of J.W. Miller Division of Bell Industries, donated two new Daiwa products for a critical test running and asked for an in-serice evaluation; the RF 440 speech processor, utilizing r.f. clipping, and the CN-720 s.w.r./pwr. meter. Reports on each were very favorable. The RF 440 carried a respectable dB increase with good audio punch and a lack of distortion, even when used by a YL, which can be a trial by fire for any type of processor. The s.w.r./watt meter is a gem. Measures forward, reflected and s.w.r. simultaneously and with the workout we gave it, it was great. Requires no calibration and no slugs; select high or low power and it's in line and ready. Both units have indicator lights that activate when transmitting. Ameco PT-2 and PT-2E (220 volt model) receive preamps were used and the incoming signal boost was spectacular, often enabling us to work a station that otherwise would have been unreadable. They were relatively new items for the Kiwis, as were the Autek MK-1 memory keyers. Each made quite an impression and the versatility and convenience of programmable keyers was a distinct plus for the c.w. ops.

The program to work Novices was a gratifying success. We reached over 200 VKs and nearly 400 USA Novices got a contact. Letters of appreciation are still coming in and it's our sincere hope that other DXers will adopt a similar format. It may be a little time consuming, but so is list or net operating, and surely the Novices deserve the same break. The US in particular rarely get DX on their c.w. allocations, and a bonifide expedition is a treat. VKs can use 80 fone. Approximately 6,000 c.w. contacts were spread over the bands during the 10 day operation. Many 1 thru 10 watt QRP stations were picked up with frequent standbys taken to listen for them. The QSP from a "big gun" when a QRP was on frequency deserves a TU.

As indicated in early bulletins, we didn't intend to dominate the bands with split operations and struck to our guns on that issue. We were able to handle the pileups very effectively on transceive, and only resorted to split on 40 due to broadcast interference and band allocations. This elicited TNX for the clean band procedures as well as from those not having split capability. It might not work for the super rare DX, but it can be done, especially if you have contest experience and are used to pulling calls out of a pileup.

What Do Ya' Think Of That?

Just new variations on old themes but interesting items arose from day to day. Simple things that some of us hadn't paid a lot of attention to, now in retrospect: How many didn't know that Chatham held separate DXCC status from N.Z.? How many never heard of Chatham and/or didn't know where it was? "Look at your atlas" was *de rigueur* for the ops. How many OMs held out for a DXYL contact, even when it meant giving up their place on a list, to wait for a YL op..a ready made audience? How well proliferated info of the DXpedition, internationally, except for, of all places, New Zealand. Many ZLs were hailed by cronies on 2 meters or the tx and reported it was the first they had even heard of the event. How expensive a DXpedition can be. The total tab could give you apoplexy. *Caveat emptor!*

Miscellany And Stats For The Collector

The Chatham Islands have an eerie and lonely kind of beauty and are rich in history and cultural lore. They lie approximately 500 miles east of New Zealand, nearer a parallel with Napier than Wellington. The area of all the Chathams is 372 sq. miles in a loosely connected 30 mile chain. Only Chatham and Pitt are inhabited. Most of the others are foul and game preserves, exotic names like the Pyramid, the Forty-Fours, Star Keys and the Sisters. The islands were discovered in 1791, at which time about 1000 Moriori tribesmen lived there and European whalers and sealers were buildings bases in the area. In the early 1800s, Maoris from the mainland invaded the islands, enslaving the native tribes and eventually dessimating them. By 1860, sealing and whaling had almost disappeared, along with the diminishing tribe, and sadly, the last true Moriori died in 1933, the end of a people and a unique culture. The present population, primarily Maori, is about 750, with only a few dozen of those living on Pitt Island. On Chatham, the main settlement is Waitangi and the lesser, Owega and Kaingaroa. Fishing, farming and meat processing are the main industries. It is abundant in wildlife but inclement weather makes good produce farming prohibitive. Lack of annual sun and warmth inhibits all but the strongest carrot in the garden, but on one occasion we did see two...repeat, two only...strange hybrid carrots that fed ten diners. With a diameter of nearly four inches, they were sweet and juicy, so obviously, good soil properties exist but don't get the cooperation of the weather. Exportation of fish, mainly crayfish or rock lobster, lamb, beef and wool derives their primary income. Vegetation is sparse, other than wind-battered shrub and some of the stronger forests of Karaka trees.

Left to right: Carol, ZL1AJL, Marion, ZL1BKL; Jim ZL4NF; Joe, ZL2AH; Chuck, ZL1ADI; (Airfield Employee).

Dendroglyphs, tree trunk carvings, are still to be seen on the trunks of the Karaka and are now numbered for easy spotting by the tourist. These human shaped and hieroglyph cuts date back many centuries and tell the ancient tales of the Moriori and the Maori. They've been the subject of research teams and in the 1960s an interesting treatise, *The Dendroglyphs of the Chatham Islands*, by Mitchell, was published, to the interest of archeologists, anthropologists and dendrochronologists. Beds of fossilized sharks' teeth yield some that have been carbon dated 11 to 40 million years. Some of our group found a few of them while on a field trip, but it required wading frigid water to recover them.

Ron, ZL1AMO, the c.w. operator.

ERC PROMISES UP TO THE MINUTE STATE-OF-THE-ART DESIGN AND PERFORMANCE WE'VE DONE IT FOR 1979

FOUR SIMULTANEOUS FILTERS IN ONE FOR UNPARALLELED QRM FREE RECEPTION (SSB & CW)
PLUS A SPECIAL PATENTED CW PROCESSOR

SL-56
AUDIO ACTIVE FILTER
(3.5 + 5.5 + 7.5 INCHES)

THE BRAND NEW SL-56 AUDIO ACTIVE FILTER SUPERCEDES OUR SL-55 IN BOTH CONCEPT AND PERFORMANCE. CONSOLIDATION OF MANY COMPONENTS HAS ALLOWED US TO MAKE 16 OPERATIONAL AMPLIFIERS (COMPARED TO 6 IN THE SL-55) INTO A FILTER GUARANTEED TO OUT PERFORM ANY OTHER AT A COST ONLY SLIGHTLY HIGHER THAN THE SL-55. THE FEATURES OF THE SL-56 ARE SO ADVANCED FROM ITS PREDECESSOR THAT CALLING IT THE SL-55A IS NOT JUSTIFIED. UNLIKE OTHER FILTERS THAT SIMPLY OFFER A CHOICE OF ONE OR TWO FILTER TYPES AT A TIME (NOTCH, BANDPASS, ETC.) SL-56 PROVIDES WHAT IS REALLY NEEDED --- THE SIMULTANEOUS ACTION OF A 6 POLE 200 Hz FIXED HIGHPASS FILTER AND A 6 POLE 1600 Hz FIXED LOWPASS FILTER WITH A 60 dB NOTCH WHICH IS TUNABLE OVER THE 200-1600 Hz RANGE. THIS 3 FILTER COMBINATION IS UNBEATABLE FOR THE ULTIMATE IN QRM FREE SSB RECEPTION. ADJACENT CHANNEL QRM IS ELIMINATED ON THE HIGH AND LOW SIDES AT THE SAME TIME AND DOES NOT INTRODUCE ANY HOLLOWNESS TO THE DESIRED SIGNAL. ON CW THE SL-56 IS A DREAM. THE LOWPASS, HIGHPASS AND NOTCH FILTERS ARE ENGAGED ALONG WITH THE TUNABLE BANDPASS FILTER (400-1600 Hz) PROVIDING THE NEEDED ACTION OF 4 SIMULTANEOUS FILTER TYPES. THE BANDPASS MAY BE MADE AS NARROW AS 14 Hz (3dB). ADDITIONALLY, A SPECIAL PATENTED CIRCUIT FOLLOWS THE FILTER SECTIONS WHICH ALLOWS ONLY THE PEAKED SIGNAL TO "GATE ITSELF" THROUGH TO THE SPEAKER OR HEADPHONES (4-2000 OHMS). RECEIVER NOISE, RING AND OTHER SIGNALS ARE REJECTED. THIS IS NOT A REGENERATOR, BUT A MODERN NEW CONCEPT IN CW RECEPTION. THE SL-56 CONNECTS IN SERIES WITH THE RECEIVER SPEAKER OUTPUT AND DRIVES ANY SPEAKER OR HEADPHONES WITH ONE WATT OF AUDIO POWER. REQUIRES 115 VAC. EASILY CONVERTED TO 12 VDC OPERATION. COLLINS GRAY CABINET AND WRINKLE GRAY PANEL.

WARRANTED ONE YEAR FULLY RFI PROOF FULLY WIRED AND TESTED AVAILABLE NOW

$75.00 POSTPAID IN THE USA AND CANADA. VIRGINIA RESIDENTS ADD 4% SALES TAX.

ATTN SL-55 OWNERS: THE CIRCUIT BOARD OF THE SL-56 IS COMPLETELY COMPATIBLE WITH THE SL-55 CHASSIS. OUR RETROFIT KIT IS AVAILABLE AT $35.00 POSTPAID.

ERC INTRODUCES A BRAND NEW CONCEPT IN THE MEASUREMENT OF VSWR AND POWER ACCEPTED BY THE LOAD

REQUIRES 115 VAC AT LESS THAN 1/16 AMP.

COLLINS GRAY CABINET. WRINKLE PANEL - BRIGHT RED LED DIGITS (.33"). DECIMAL POINT IS THE PILOT LIGHT.

1.8-30 MHz

TWO SO-239 COAX CONNECTORS ARE AT THE REAR PANEL.

DIMENSIONS 3.5 x 5.5 x 7.5 INCHES.

WEIGHT IS 2 POUNDS.

THE MODEL SL-65* (20-2000 WATTS) AND THE QRP MODEL SL-65A* (0.2-20 WATTS) DIGITALLY INDICATE ANTENNA VSWR UNDER ANY TRANSMISSION MODE -- SSB, CW, RTTY, AM Etc. THERE IS NO CALIBRATION REQUIRED AND NO CROSSED METER NEEDLES TO INTERPRET. SIMPLY LOOK AT THE READOUT AND THAT IS THE VSWR. SPEAKING NORMALLY INTO A SSB TRANSMITTER MIC. INSTANTLY CAUSES THE VSWR TO BE DISPLAYED THROUGHOUT YOUR ENTIRE TRANSMISSION. REVERSING THE POSITION OF A FRONT PANEL TOGGLE SWITCH AND THE DISPLAY INDICATES THE NET POWER (FORWARD LESS REFLECTED) THAT IS ACCEPTED BY THE ANTENNA. THE PEAK OF THE NET PEP IS DETECTED AND DISPLAYED WITHOUT FLICKER FOR ANY MODULATION TYPE. DISPLAY UPDATE IS CONSTANT YET FLICKER FREE AS YOU MAY CHANGE THE POWER ACCORDING TO YOUR VOICE. THERE IS NOTHING LIKE THIS QUALITY INSTRUMENT AVAILABLE ANYWHERE ELSE. IT IS THE ONLY VSWR-NET POWER INDICATOR THAT LETS YOU KNOW THE STATE OF YOUR ANTENNAS AND TRANSMITTED POWER AT ALL TIMES WHILE TRANSMITTING. EITHER MODEL IS A SOPHISTICATED DEVICE CONTAINING FOUR CIRCUIT BOARDS AND THIRTEEN INTEGRATED CIRCUITS.

WARRANTY ONE YEAR

SL-65
VSWR INDICATOR

- TWO DIGIT DISPLAY SHOWS VSWR TO AN ACCURACY OF .1 FOR VALUES FROM 1.0 AND 2.2. ACCURACY IS TO .2 FOR VALUES FROM 2.3 TO 3.4 AND TO .3 FROM 3.4 TO 4.0. FROM 4.1 TO 6.2 THE INDICATION MEANS THAT VSWR IS VERY HIGH.

- FOR VSWR VALUES NEAR 1.0, THE POWER RANGE FOR A VALID READING IS 20 - 2000 WATTS OUTPUT. FOR HIGHER VALUES THE UPPER POWER LIMIT FOR A FLICKER FREE VALID READING IS SOMEWHAT LESS (35 - 1000 WATTS FOR VSWR AT 2.0).

- DIVIDE THE ABOVE POWER LEVELS BY 100 TO OBTAIN THE PERFORMANCE OF THE SL-65A QRP MODEL.

SPECIAL AUDIO VERSION AVAILABLE FOR THE SIGHTLESS • WRITE FOR DETAILS •

SL-65
NET POWER INDICATOR

- THE POWER DISPLAYED IS THE DETECTED PEAK OF THE PEP FOR ANY MODULATION. THIS IS THE POWER THAT THE TRANSMITTER IS "TALKED" UP TO. DISPLAY DECAY TIME IS ABOUT ONE SECOND.

- THE POWER DISPLAYED IS THAT WHICH IS ACCEPTED BY THE ANTENNA - (FORWARD LESS REFLECTED).

- POWER IS DISPLAYED ON THE SAME TWO DIGITS AS VSWR IN TWO AUTORANGED SCALES. 20 TO 500 WATTS AND 500 TO 2000 WATTS. TRIPOVER AT THE 500 WATT LEVEL IS AUTOMATIC EX: A READING OF 1.2 COULD MEAN 120 OR 1200 WATTS. YOU MUST KNOW WHICH RANGE YOU ARE IN.

- ACCURACY IS TO 10 WATTS IN THE LOWER RANGE AND 100 WATTS IN THE UPPER RANGE. DIVIDE POWER SPECS BY 100 FOR SL-65A.

PRICE: $189.50 POSTPAID IN USA & CANADA. VA. RESIDENTS ADD 4% SALES TAX.

BOOKLET AVAILABLE AT $2.00 REDEEMABLE TOWARD PURCHASE.
* PATENT PENDING.

ELECTRONIC RESEARCH CORP. OF VIRGINIA
P. O. BOX 2394
VIRGINIA BEACH, VIRGINIA 23452
TELEPHONE (804) 463-2669
Please send all reader inquiries directly.

the drab specimens taken from the coastal waters of the US, these have an intense irridescence and vivid blues, greens and deep lavenders in rainbow hues that defy description. The meat is seafood and the shell exported for it's decorative value.

Amateur botanists take note: Chatham has it's own flower, peculiar to that region alone. The Chatham Lily has deep green glossy foliage, huge cornucopia shaped leaves, often measuring 1½ feet in diameter. This massive display makes the blossom an anticlimax. It is a tiny pale blue cluster that bursts from a pod closely resembling beer hop. Totally out of keeping with the rest of the plant's growth and size.

Well, that's an encapsulated picture of the Chatham Islands. Weather that is purported to be mean average of 52° F; it's mean all right, and ranged far lower than that our entire stay. Herculean winds, bone-shaking cold, poor accomodations for the non-resident, but looking at it's high grassy pastures dotted with sheep and cattle, and the strange but beautiful coastline, it's minuses are somewhat offset by the pastoral scene.

A couple of our members were past DXers, but the majority of us were rookies, wetting our feet with Chatham, hoping to learn a lot. Would we, as recent grads of the School of Hard Knocks, *magna cum laude,* do it again somewhere else? Is there balm in Gilead? You betcha'!

Unanimous TNX to the equipment donors, including WA6HNR, WA6VZO and WA6YQU . . . the helpful people of Chatham Brian and Naomi Donaldson, Lance and Barbara Kelly, and the many fellows who handled stateside lists for us; F6CYL, for the same function with the lengthy European list. Les, WA6HJL, the talented staff artist for Alkan Publishing, Inc. provided the custom designed art work for the distinctive QSL cards. QSL manager Gary, N2CW, assisted by Bob, N2OO and the gang who lent the manual labor to get them out in the mail.

To the 22,000 hams who disproved the dire predictions of the coldwater tossers, special TNX for reaffirming our opinion that someone out there did need Chatham Island. To the ones who made DXCC Honor Roll with the addition of our ZL3/C, congratulations . . . you knew it all the time. To Chuck, ZL1ADI, a vote of confidence for his abilities as a coordinator and director of such a venture. "Boss," what you lack in the humor department you compensate with technical savvy and expertise; your credentials are established.

WHEN OUR CUSTOMERS TALK... WE LISTEN.

Jim Clouse, K5JN
Oklahoma City, OK

Phil Litchfield, WA1OFP
New Canaan, CT

Colin Richards, 9M2CR
Singapore

Ed Trego, W9WKC
Hoopeston, IL

Reinhard Richter, DJ1KM
Hannover

From around the world their RTTY messages read loud and clear.

At HAL we *want* to hear what our customers have to say about RTTY practices, problems, and possibilities. So when they talk . . . we listen . . . and respond.

The result is that HAL Communications equipment stays at the leading edge of RTTY design with . . . features that open up new capabilities for greater enjoyment of RTTY operation. And with performance reliability so certain, we offer a full one-year warranty.

Write or give us a call. We'll be glad to send you our new RTTY catalog.

HAL COMMUNICATIONS CORP.
Box 365
Urbana, Illinois 61801
217-367-7373

For our European Customers Contact:
Richter & Co., D3000 Hannover 1
I.E.C. Interelco, 6816 Bissone/Lugano

Our Readers Say

People to People

Editor, CQ:

After reading the article "Amateur Radio and the People's Temple Net", (August, 1979, *CQ*, pg. 24), and not to be outdone by my peers, I also had contact with WB6MID/8R3 on Feb. 2, 1978. My contact was by SSB and was with a YL named "Margaret". I received a QSL by direct mail signed by her and Al. I did not read any mention of her in the article.

I also heard her several more times, but only made one contact. I asked her about IRCs for QSL, but she said that IRCs were not needed. However, I did send IRCs.

Just thought my story might be a little different.

Herron C. Hall, WB5OGQ
Gulfport, MS

Both Are Dangerous

Editor, CQ:

In your July, 1979 issue of CQ, your editorial on clandestine amateur activities during the Iranian crisis was quite good. I am in complete agreement with your statement that covert amateur radio operation makes us all like spies. I am sure that many foreign countries which are now considering opening their countries to amateur operation may have second thoughts after considering amateur conduct during this crisis. I also feel these actions may be detrimental to amateur radio during WARC.

On the other hand, I find it hard to understand why a publication which takes such a sensible stand on one issue, can take such a poor stand on another issue — namely personal safety. I am referring to the article in the "Antenna" section which shows how K4VX repairs his quad using an aluminum ladder suspended horizontally at 96 feet. The article referred to this as a "nifty" method of doing antenna maintenance. Assuming the tower and cable are safe, what method does a person use to safely secure the cable to the tower and the ladder? How much horizontal stress can a section of aluminum extension ladder withstand? Without adequate answers to these two questions, I feel that "CQ" has done a disservice to its readers by putting this article in the magazine. Even if these questions had been answered, I think the article should have been accompanied with the warning "This Method of Antenna Maintenance is Hazardous to Your Health."

Bill Mullin, AA4M
Falls Church, VA

A Stub Is A Stub . . .

Editor, CQ:

Those of your readers who paid attention to my article (What's A Stub?, August, 1979, *CQ*) would have noted my affinity toward the short circuit - to the extent that I inadvertently labelled the left-side column of open-circuit stubs in Fig. 6 as being "Short-circuit" lines. My fault.

But I have no idea how the right-side column of favored short-circuit stubs got to be headed as "open-circuit" lines. Surely I would never fault the shorts. Around our QTH, we usually blame the dog for such mysterious, otherwise unassignable happenings.

Vincent J. Luciani, K2VJ
Egg Harbor City, NJ

—The mistake was ours and not yours. It obviously hasn't bothered the many readers of your articles. One example from our mail is next. —Ed.

Editor, CQ:

Mr. Luciani's article pertaining to stubs was, in my estimation, a landmark in the area of factual and humerous journalism.

It is a shame that aspiring students of electronics don't have the opportunity to be associated with individuals like Mr. K2VJ.

I believe it is about the first article that I have seen that projected any subject on electronics in such a delightful manner.

I only wish that 50 years ago some of my Profs presented various subjects in such a manner. Would certainly have saved me a lot of time, and at the same time would have made the given subject quite palatable!!

This person should be teaching someplace!!!

On a more nostalgic note, how about when - - - . . - - meant "Warning—Hi Power" in congested areas? Then you could copy code from the spark from the antenna to the ground terminal. Hopefully no phones where on at the time, if you heard the — - - . . - - ?

And how about the regenerative receivers that were used for communications in congested areas. We just used to key them. Surprising how far one could communicate.

Would still like to hear from someone that has used the old QMS impact transmitter. It was as close to CW as one could imagine, but still rough. Many times I worked WCC from 1500 miles with this little thing.

I noted the Ultra Skyrider. I have an SX 36 and an RME 69 that are still popping.

I think the old marine ops would be interesting to hear from.

Paul T. Kiefer
119 Norwood Drive
Louisville, KY

Part of the F.F.C. rules allows low power unlicensed communications on certain frequencies. This article tells what is happening on one of those bands.

QRP On 1750 Meters

BY PETE BRADLEY*, N1ADX

Amateur radio is continually changing and evolving. The combined skills of many amateurs and many experimenters have brought us from spark gaps to c.w., through a.m. to s.s.b. and now to n.b.v.m. (narrow band voice modulation) and TV. Antenna designs have also been improved through years of experimentation. Unfortunately, amateurs interested in experimental work have been faced with ever increasing costs as they use higher frequencies. There is an inexpensive alternative: use low power, low frequency transmitters. Since 1950 there has been an all-mode longwave band available for experimental work. Ever heard of the 1750 meter band?

The 1750 band is *not* an amateur allocation. It is available to *anyone* in the United States for low power operations. No license is required so the band can also be used by Novice class students to practice c.w. operating procedures on the air. Component layout is not critical at low frequencies so Novices can readily build their own transmitter. How better can we give the newcomer a taste of amateur radio as it used to be?

Part 15 of the F.C.C. rules covers low power communications devices operating between 10 - 490 kHz, 510 -1600 kHz and 26.97 - 27.27 MHz. Rigid field strength restrictions make it difficult for many experimenters to operate within the rules. However, there are three ranges where the filed strength rules are waived. Between 510 - 1600 kHz operation is permitted using 100 milliwatts of power with a 3 meter long antenna. From 26.97 - 27. MHz operators may use 100 milliwatts and a 1½ meter long antenna (i.e. CB walkie-talkies). The best deal however, is in the 1750m band where the following rules apply.

Operation between 160 - 190 kHz is permitted if the power input to the final stage of the transmitter (exclusive of filament) does not exceed one watt, all emissions outside of the band are suppressed at least 20 dB below the unmodulated carrier, and the antenna length does not exceed 15 meters (excluding ground radials and the antenna coupling coil). That means unrestricted short range communications by any mode and you can use any call letters you want (*but you must not use your amateur callsign or any callsign issued for other services*). The F.C.C. does not allow any illegal use of the band, of course—eavesdropping and profane language are not permitted.

CQ readers may remember a previous article about the 1750m band (April 1968, p. 31) in which G.E. White described a crystal controlled transmitter designed by Jim Hagan, WA4GHK. The author of that article had heard of 'more than a dozen' experimenters operating on the band. Largely as a result of articles like the *CQ* one, ten years later the situation is very different. Now there could be more than a hundred low frequency experimental stations on the air (usually abbreviated to *Lowfers*). For anyone who wants to know more about Lowfers and 1750m, I recommend two excellent books by Ken Cornell, W2IMB. "The Low And Medium Frequency Radio Scrapbook" (3rd. edit.) and the "'77/'78 Addendum" to the "Scrapbook" are available from the Ham Radio Bookstore, Greenville NH 03048. The author covers all aspects of unlicensed communications and describes many suitable transistor and tube circuits to help you to get a transmitter on the air. If you ever write to Ken, send him an s.a.s.e. for the reply.

With one watt of power it is important to construct the transmitting antenna carefully. Many experimenters have shown that good results are obtained using 15 meters of vertical wire or tube sections (49 feet and 2.2 inches). The antenna could have ground radials and the efficiency will depend on the local conditions. If you have small yard, Cliff Walker, WA6GGI, suggests that you use the house ground instead of radials. Apparently his 40 foot vertical antenna with a capacitive top hat loads up quite well. Many 1750m transmitting antennas include a top hat within the permitted length, while others are fed at either the top or the base using coaxial line. The shield of the coax must be effectively grounded so that it cannot be considered as a radiating part of the antenna. In the past there was some confusion over the interpretation of the F.C.C. antenna rule. A recent discussion of the subject by W2IMB suggests that the antenna coupling coil, ground radials and shielded coax need not be considered as part of the permitted length (see *The Lowdown*, October 1978, p.2, published by the Longwave Club of America, P.O. Box 33188, Granada Hills, CA 91344 - specific issues are 50¢ each). The club is available to help anyone interested in longwave listening or in Lowfers' activities. If you want further information after reading this article, send a business sized S.A.S.E. and ask for a sample copy of *The Lowdown*.

Inductive coupling is popular between the transmitter and the antenna. Tuning is accomplished by connecting a neon bulb to the antenna and adjusting for maximum brightness. At low frequencies even one

*200 E. Main Street, Westboro MA 01581

watt of power can generate quite high voltages in the antenna. This can be a shock hazard.

In these days of appliance operators, 1750m still gives the opportunity to construct transmitting equipment. Home-brew transmitters should be checked to ensure that they cannot interfere with any licensed operation outside of the band.

There is no restriction on the antenna used with the receiver. Rotatable loop antennas with a FET preamplifier give excellent results and tuned longwires are popular with other users of the band. Receivers with a longwave band are common in Europe where there are several high power broadcast stations on longwave. Several excellent receivers are available in the U.S.A. which tune longwave frequencies. Converters which operate through the 80m amateur band are also commercially available. In addition *QST* magazine has published nine articles on longwave receivers in the past twenty years.

Propagation is mainly by groundwave at these frequencies. With one watt and an efficient transmitting antenna, you can expect effective c.w. communications up to 30 miles or so. QSO of 100 miles are common and 300 miles are possible. On several occasions the 1 watt transmitter operated by W7FS was copied 833 miles away by WB6EER.

The propagation conditions vary little during the year and the background noise is least during the winter months. Household light dimmers and old TV sets generate unpleasant noises at these frequencies and you will also hear some unmodulated carriers on the band generated by power company operations (see the article by Rich Brunner, AA1P, *QST*, March 1978, p.36). For these reasons most longwave listeners use sharp audio filters when copying c.w. signals. An upcoming *QST* article by WA6GGI explains how to find those holes in the QRM where Lowfers can operate.

The best way to promote 1750m activity in your area is to organize a net with a group of friends. Meet on the air as often as possible and encourage participation from new club members who do not have their Novice license. You might even find that your area already has Lowfers operating on a regular basis.

Many longwave enthusiasts are members of the 400 strong Longwave Club of America (LWCA). Groups of enthusiasts within the club are interested in different longwave activities. Some listen in on the fast c.w. communicators (near 500 kHz). Others like to listen for some of the hundreds of navigation beacons (down to 190 kHz) which are used on a worldwide basis for aeronautical and marine radiolocation. The beacons identify continuously with 2-3 letters in c.w. Some of these stations also have regular a.m. broadcasts of aviation weather. 190 - 160 kHz is used for low power experimentation of course. The European broadcast stations may be heard between 285 - 150 kHz. Around 100 kHz are frequencies used for the Loran-C navigation system, there is the WWVB standard time signal at 60 kHz, and below 100 kHz there are high power military point-to-point stations which usually use RTTY but are sometimes heard using c.w. Some longwave listeners are monitoring solar flare acitivty at frequencies below 60 kHz. Between 15 -10 kHz the Omega long-range navigation system operates. At even lower frequencies, there is also a group of Lowfers interested in experimental communications.

The 1750m band provides an ideal opportunity for amateurs and unlicensed operators to conduct experiments or to test home-brew equipment on the air. Only in the United States of America are such bands available. This is a valuable privilege—let's make the most of it.

KENWOOD DENTRON

ICOM KDK

ORDER TOLL FREE!
800-845-6183
IN S.C. DIAL 803/366-7157

CALL NOW FOR SPECIAL PRICES

G.I.S.M.O.
2305 CHERRY ROAD
ROCK HILL, S.C. 29730
803*366*7157 EXIT 66-B OFF I-77

73,
THE GISMO GANG

YAESU ALPHA

CIRCLE 19 ON READER SERVICE CARD

a regular feature by

THEODORE J. COHEN N4XX

dateline... Washington, D.C.

The ins and outs of the Washington scene

Amateurs Swamp FCC With Complaints On Russian "Woodpecker"

Following comment on the Russian over-the-horizon high-frequency radar system (nicknamed the Woodpecker) in the July and August 1979 *dateline... Washington, D.C.* columns, telephones at the FCC's Washington, D.C., Watch Office lit up like Christmas trees everytime the OTH radar systems came on the air.

So great was the response by Amateurs that Mr. C. Phyll Horne, Chief, Field Operations Bureau, FCC, requested your Washington correspondent to retract the suggestion that operators call the Watch Officer with complaints. Noted Mr. Horne: "The Watch Officer can be very sympathetic but he cannot resolve the problem. The agency (FCC) will, however, do whatever may be possible in this matter."

"Matters that go beyond the national boundaries are handled by the Department of State," continued Mr. Horne. "However, the Department of State can at most register a complaint with the foreign government. It is the responsibility of each government to assure that transmissions within its borders conform to international treaties and agreements."

A spokesman at the Department of State, when queried on Mr. Horne's comment, noted that the "normal" route for complaints by operators licensed by the FCC is first to the Commission, and thence, to the Department of State.

Given the FCC's response, however, the spokesperson acknowledged that "someone in the government must assume responsibility for handling the complaints," and so, it was suggested that those wishing to file complaints *may do so by writing State:*

Office of International Communication Policy
Department of State
Room 5824
Washington, D.C. 20520

Do not telephone! Only written complaints can be entered into the Department of State's record on the Russian OTH radar activity.

The spokesperson concluded her remarks by noting that the Department of State was "doing everything that was humanly possible to stop the interference."

8603 Conover Place, Alexandria, VA 22308

Rewrite of Federal Communications Laws Killed

H.R. 3333, the proposed sweeping rewrite of the Communications Act of 1934 (as amended) is dead for this session of the Congress.

Rep. Lionel Van Deerlin (D., Calif), Chairman of the House Commerce subcommittee on communications, noted earlier this year that it was increasingly difficult to gain support for many aspects of the proposed rewrite. Particularly troublesome were those portions of the bill which addressed changes in the broadcasting industry.

Also detracting from the work on H.R. 3333 were matters pertaining to the Energy Crisis.

Many aspects of H.R. 3333 were of interest to Amateurs. Included were sections on telephone terminal equipment and connections; fees; susceptibility of devices to unwanted signals; point of scale control of transmitting equipment; and license terms.

It is truly unfortunate that once again, matters as important as that pertaining to unwanted signals (i.e., radio-frequency interference, or RFI) have been set aside by the Congress.

FCC Moves on WCARS Complaints

For years, operators in the West Coast Amateur Radio Service (WCARS) have been plagued with interference. This interference, presumably from other Amateurs, intensified early in 1979, and complaints to the Commission by WCARS operators increased accordingly.

In a new spirit of concern for such interference, the FCC, in mid-1979, moved to prove that the interference is malicious and deliberate. It is expected that by the time this column appears in print, sufficient evidence will have been collected to take legal action against the individual or individuals involved.

ARRL RFI Task Group Dies An Early Death

The American Radio Relay League's (ARRL) Radio-Frequency Interference (RFI) Task Group died on 19 July 1979, in Baton Rouge, Louisiana. The Task Group was a victim of benign neglect.

Born to any uneasy marriage between the League's technical staff and members at-large, the Task Group continually suffered the effects of a broken home. Regardless, in its heyday, and under the able direction of Victor C. Clark, W4KFC, the Task Group prepared numerous articles for publication in Amateur journals; presented several papers in International Communications Conferences (ICC's) sponsored by the Institute of Electrical and Electronics Engineers (IEEE); gave many presentations on RFI to Amateur Radio and Citizen Band (CB) organizations in the greater-Washington, D.C., area; assisted in the preparation of House and Senate legislation on RFI; prepared the RFI assistance list,

No - 37 - 38

which has since been published by the FCC and the Canadian Department of Telecommunications (DOT); prepared a monthly column on RFI which was published in *Worldradio News;* and prepared and distributed thousands of RFI Packets, which were used by Amateurs and CBers to resolve RFI problems with home entertainment devices.

In recent years, however, staff support and member participation dwindled, and the Task Group did not even receive mention at the 1979 Second Meeting of the Board of Directors of the ARRL.

Survivors include Victor C. Clark, W4KFC; Harry A. McConaghy, W3SW; Harold R. Richman, W4CIZ; Edmund B. Redington, W4ZM; William S. Grenfell, W4GF; Morton Bleuder, W4LPZ; Lew McCoy, W1ICP; Don Gerue, K6YX; Paul Rinaldo, W4RI; Robert M. Booth, Jr., W3PS; Doug DeMaw, W1FB; and your Washington correspondent.

In lieu of flowers, it is suggested that prayers be said for the ARRL Ad Hoc Committee on Biological Radiation Hazards, brother to the RFI Task Group, and though a well-intended creation of the ARRL Board, yet another committee destined for obscurity. Rest in peace.

NTIA To Lead Task Force On Non-ionizing Radiation

The National Telecommunications and Information Administration (NTIA), part of the Department of Commerce, will lead a new task force on nonionizing radiation. Specifically, the NTIA has been assigned to "develop a coordinated plan for all Government research" on this subject. Use of a task force in this capacity is necessary because the effects of nonionizing radiation on health will be widely studied by a large number of Federal agencies during the 1980's. It is expected that the NTIA task force will recommend that funding for certain research projects be included in the fiscal 1981 budget.

FCC Reports RFI Statistics For Third Quarter Of FY 79

According to Mr. Jeffrey Young, Chief, Investigations Branch, FCC, the Commission received 17,942 complaints of alleged radio-frequency interference (RFI) during the third quarter of fiscal year (FY) 79 (i.e., during the months of April, May and June). This figure is slightly lower than the projected and seasonally adjusted figure of 20,000. Nevertheless, the number of complaints, while not on the increase, is sufficiently high as to cause concern within the Commission.

Of the complaints received, transmissions from equipment operating in the 27 MHz Citizens Band (CB) accounted for 13,376 of the complaints (75%); complaints which involved Amateur transmissions accounted for 851 complaints (5%). It is interesting to note alleged interference to CB operations by other CB operators accounted for 2035 complaints, while Amateurs cited other Amateurs for interference in 295 cases.

As in the past, alleged television interference (TVI) accounted for the greatest number of complaints. During the third quarter of FY 79, TVI complaints numbered 13,663. Thus, better than three out of every four RFI complaints cited a television receiver as the "victim" device...and there still is no hope in sight that the Congress will soon pass an RFI bill (see material on H.R. 3333 elsewhere in this column).

Your Washington correspondent thanks Mr. Art Simonsen, WA3ZWP, for his contribution to this months column.

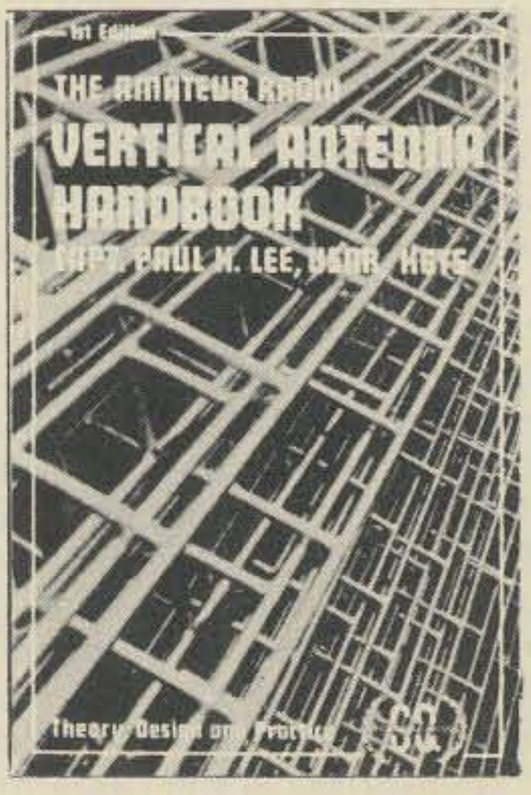
$1.25

That's all it takes to get a copy of the USA-CA Record Book delivered to your door. Order one or two today and start collecting counties for one of amateur radio's most prized awards, USA-CA.

CQ MAGAZINE
14 Vanderventer Ave.
Port Washington, N.Y.
11050

VERTICAL ANTENNA HANDBOOK

Compiles 22-years worth of material from the pages of *CQ* on vertical antenna theory, design installation, construction. Covers verticals arrays, feeding and matching, short verticals, ground effects, multi-band and single-band verticals, answers the most common questions about vertical antennas. 6" X 9" 136 pages. **$5.00**



Please send me _____ copies.

Name _____ Call _____
Address _____
City _____
State _____ Zip Code _____

CQ Magazine
14 Vanderventer Avenue
Port Washington, N.Y. 11050

a monthly feature by

A. EDWARD HOPPER, W2GT

Awards

News of certificate and award collecting

The November, "Story of the Month", as told by Howy is:

Howard A. Gifford, WA2WCW. All Counties--181, 4-7-78.

Well, here is a County Hunter's story from a native New Yorker - born April 19, 1924 and outside of my World War II service with the 320th Fighter Control Squadron in the Asiatic-Pacific campaign, I have lived in New York all my life. My Military service took me to many of those exotic DX islands from Guadalcanal to the Philippine Islands with numerous island hopping in between. I returned stateside in January 1946 and married my YL Anne, making her an XYL. In 1947 we had a daughter Kathy who is an R.N. with a Bachelors Degree from Marymount College and employed at Memorial Sloan-Kettering Cancer Center in the Nuclear Medicine Department. Not only has her career made us proud parents, but her blond, blue-eyed 11 year old son Alex has made us very proud grandparents. Alex has known some code since he was six years old, but not enough interest yet to be a ham.

My civilian career was in commerical office building management with John W. Galbreath (better known for his owning the Pittsburgh Pirates Baseball team). My responsibilities were for the maintenance of several million square feet of office building space from New York to California.

My hobby was in the use of tools -building furniture, cabinets and reconstructing the interior of our home, also helping my neighbors do the same. I still help my neighbors by lending my tools and knowledge.

The life of leisure all started in 1972 when my not unexpected cardiac condition started. I say not unexpected as heart disease was hereditary in my family. I still have two younger brothers that have heart disease. I credit my longevity to having

The White Tail Deer Award.

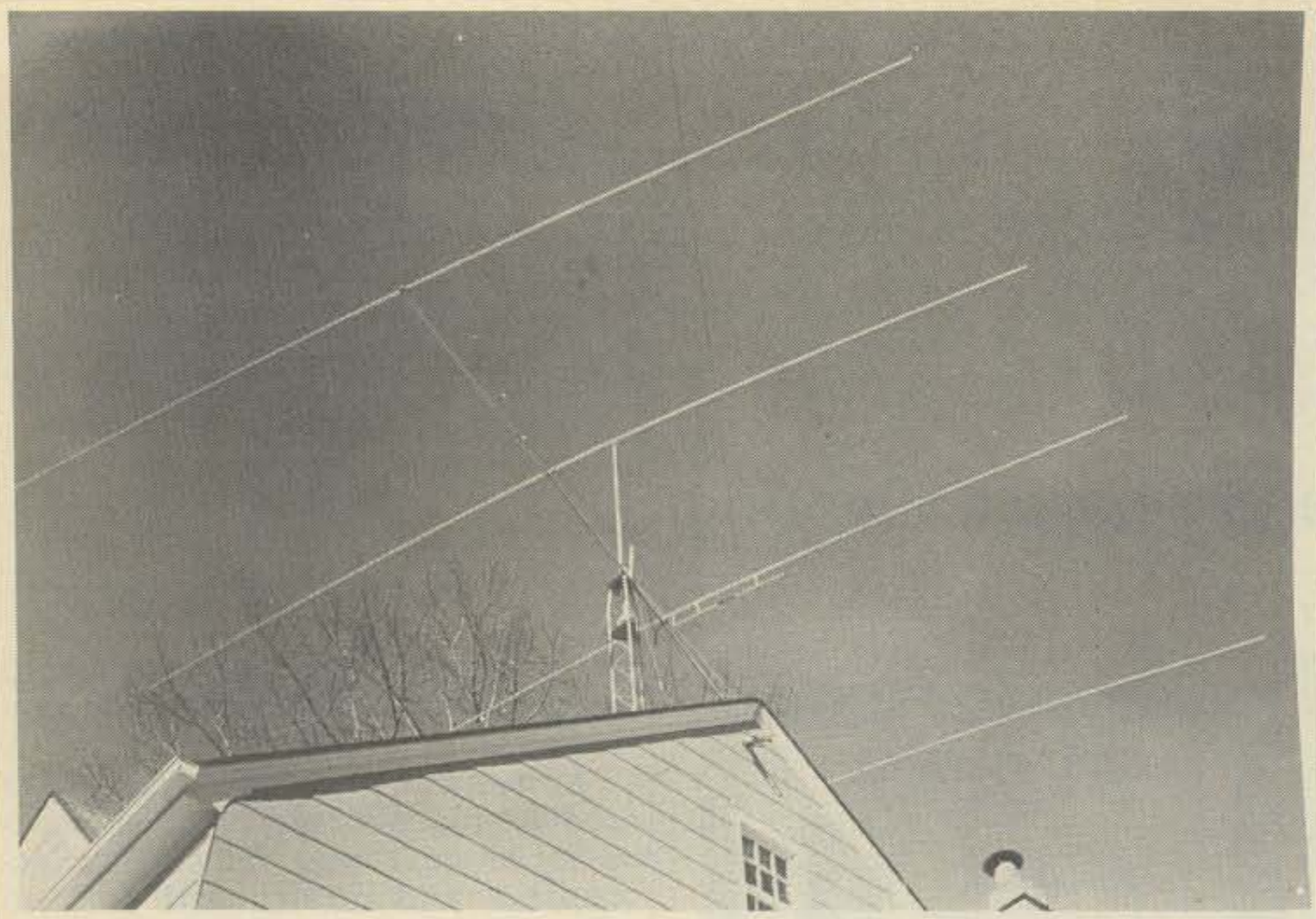
undergone open heart surgery in 1973. Although I later had complications that hospitalized me and forced me to retire in 1974, I know I would not be here today if it were not for heart surgery. During my recovery period, I was told by my cadiologist to find a new hobby and so I turned to amateur radio in Mended Hearts we say, "It's great to be alive and help others". I found that it's also great to be a ham and help others, as word went out that I needed help in becoming a ham.

Many came to my aid. I was told to contact the Wantage Amateur Radio Club where I was immediately accepted and instructed in the necessary theory WB2DQP, Hank. Nat, WB2SEL took me under his wing and instructed me in the code. He was a former instructor of code in WW II, and made it all come easy. I am now and shall ever be a member of the Wantage ARC as they are responsible for the many days of sunshine put into my life when I received my Novice ticket 6-21-74 and was able to upgrade on 1-2-76.

My County Hunting days started with a novice contact with K8SWW. Art on 6-10-75. Art always works the novice bands and has a new call today which I don't know. When I worked Art, he told me he was bounty hunting, but I soon found out I copied wrong and he was County hunting. This stirred an interest in me and

The Neat Station and Person, Howy, WA2WCW.

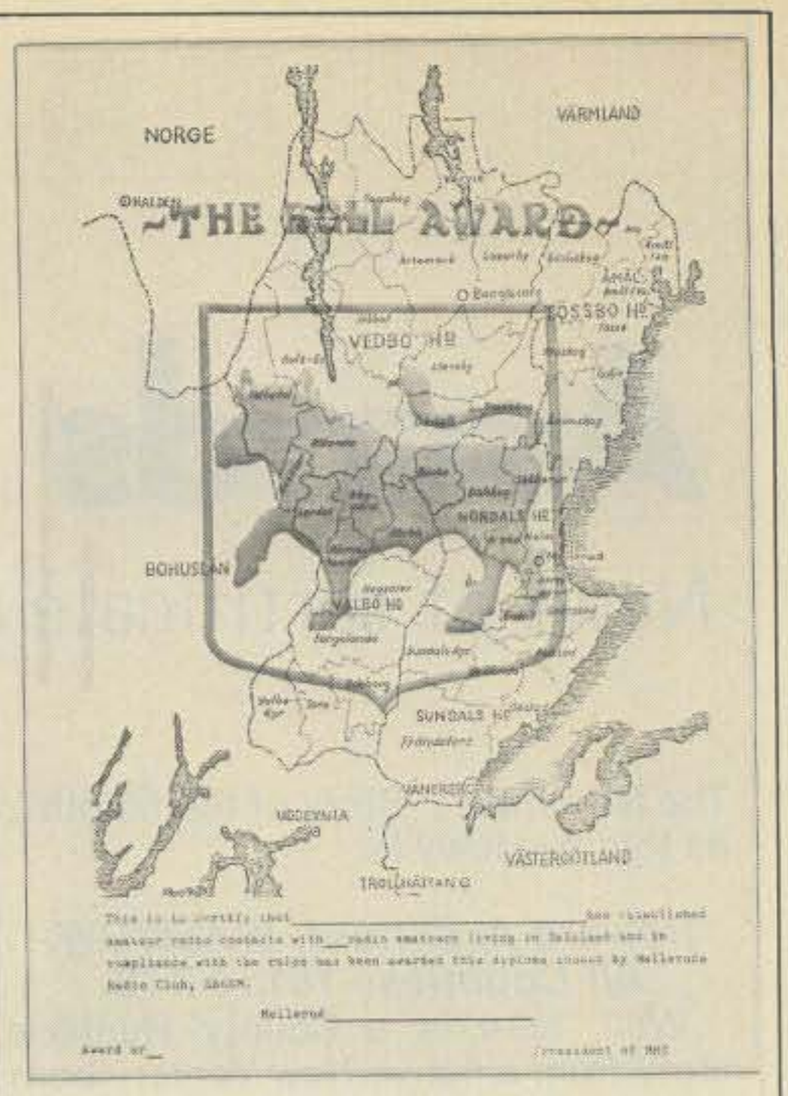
P.O. Box 73, Rochelle Park, N.J. 07662



The Reason for that Fine Signal from Howy, WA2WCW.

every contact soon after I would look for a new county. I believe I had 400 plus counties confirmed as a novice.

In 1976 when I upgraded, my first thought was to obtain Bicentennial Worked All States - this I soon had with #128. I only had 40 and 75 meter inverted "Vs" so these were the two bands on which I spent my time. I was aware of the County Hunters on 14.336 through Bea, WA2GPT and Marv, WB2SJQ, and they also told me to listen around 7.240. On March 18, 1976 I came across K4FZG, Chuck, calling and working mobiles, I listened awhile and decided to jump in. At 16:49 Z I worked my first Mobile, WB9AAJ, Bruce, in Lewis County,



The Bull Award (SM6)

Missouri. Now the County Hunting bug had really bitten me. K4FZG asked me to help, which of course, I was happy to do. We asked each mobile worked to pass the word on 14.336 that we had a net on 40 meters, and if possible, to QSY at the end of their run on 20 meters. We had a very active couple of weeks on 40 meters, as I found Chuck was on vacation and when he didn't show up the following week, neither did the mobiles. I tuned to 14.336 and realized what I was missing. I decided I had to put up something decent and went all the way with a peak mounted Wilson M-204 4 element monobander. If I had the county that was being run on the net, I would go looking for DX. On November 2, 1976 I worked DA1DM, Dennis. His QSL remark said, "Tnx QSO, QSL Howard, hpe to wrk U from new QTH in N. Dak". I was not aware until several weeks after working WB5KEA on March 29, 1978 in Harding County, South Dakota for #3075 that this was ex-DA1DM, Dennis Miller. Amateur radio makes it a small world.

My station equipment in the photograph consisted of: Kenwood Twins, T599A, R599A, Tempo RBF-1 wattmeter, straight key, Heath keyer, a working "World Time Clock" (The Heath keyer I gave to a blind ham). I have since added a Kenwood TS-520 which I use to go mobile. I have all the Hustler mobile resonators, 10 meters through 75 meters. Have two Shure 444 microphones which I use at the base station and a Kenwood MC-50 which I use at home or mobiling. I have replaced the Heath keyer with the Ten-Tec KR-50 keyer. On 2 meters I use the KDK 2015R with the CES

FLESHER CORP.

RTTY made easy !

TR-128
NEW FROM FLESHER

*RTTY REGENERATIVE BAUD RATE CONVERTER

TTL compatible connections for direct hook-up to the TU-170, also adaptable to other units.

- Five standard baud rates
- Stable crystal-controlled oscillator
- 128 Character storage capacity with storage status meter to show buffer fill
- Continuously variable character rate

Wired $239.95 Kit $179.95

TU-170
TERMINAL UNIT

Connect to your receiver speaker, transmitter microphone jack, and teletype machine and you're on the air. Ideal for HF and VHF auto start operation.

- Autostat with threshold control and solid state relay
- Stable audio frequency shift oscillator produces phase coherent sine wave tones
- TTL compatible inputs and outputs for auxilliary equipment
- High level output for scope tuning

WIRED $234.95 KIT $159.95

Flesher products . . . the critics choice!

master charge VISA

FLESHER CORP.

P.O. Box 976-C Topeka, Ks. 66601 913/234-0198

Add $3.00 for postage and handling.

CIRCLE 16 ON READER SERVICE CARD

Micropad (mic with touchtone pad).

I found the best bunch of hams on the County Hunting Net. So much so that I just completed working them all a second time, this time with an inverted "V" in the attic. Dan, WA9WIF (one of the CW County Hunters) went to Routt, Colorado for my last one.

The mobiles and net control stations just love to help you get that next to last, and last in each of the 50 states. The cost is kept to a minimum by the use of the Mobile QSL Bureaus and mobile reply QSLs. My thanks to *CQ* Magazine for making this all possible with the nicest certificate and plaque awarded by anyone. Try it, you'll like what you hear. I'm now working all YL/XYL with about 2500 confirmed, All Mobile.

Also thanks to Anne, my wife, for typing this in her spare (?) time. She could write a book on her Civic associated activites which takes many hours of her spare (?) time. Anne works for an Engineering Association in Manhattan"

Awards Issued

George Challenger, K5GC (ex-W5HTM, W5HTM/KP6, VR3P) made All Counties endorsed Mixed.

Reverend Andy, WA9OBR (XYL, Marleta is WB9PQO) waited until he had them all and qualified for USA-CA-500 through All Counties, Mixed.

Clayt Donaldson, W0IU added to his nice collection. All Counties endorsed, Mixed.

Gene Harrelson, KB5KM (ex-WB5GZR) waited until he had them all and accepted USA-CA-500 through All Counties endorsed, Mixed.

Howie Bromberg, K1VSJ gained USA-CA-3000 with the unusual endorsement of All 14; All SSB; All Mobile to Mobiles.

Lynn White, WB5NFS (again with the kind help from Howard, WA2GLU/7) collected USA-CA-2000.

Pat Creapo, WD9BCG had me send her USA-CA-1500.

Vivian Scott, WD0EMS (Early Morning Sunshine) acquired USA-CA-500 endorsed All SSB; All 14 MHz, and USA-CA-500, Mixed.

Bob Leatherman, WB9GCU received USA-CA-500 endorsed All CW.

Bob Aldrich, WD8OWA was pleased to get USA-CA-500 endorsed Mixed.

Awards

White Tail Deer Award: Sponsored by the Mid-Michigan Amateur Radio Club and available to all licensed amateurs and short wave listeners. Requires contacts with two (2) Mid-Michigan Amateur Radio Club stations, or contacts with one (1) MMARC station and three (3) White Tail Award holders.

Special Honor Roll
All Countries

#231 George E. Challenger, K5GC 7-13-79.
#232 Dr. Elwood Anderson, WA9OBR 7-13-79.
#233 Clayton E. Donaldson, W0IU 7-21-79.
#234 Gene Harrelson, KB5KM 8-2-79.

For Novices, one (1) contact required with MMARC station or one contact with a White Tail Award holder.

For Short Wave listeners, the requirements are one (1) MMARC station heard or one (1) White Tail Award holder.

Send a detailed list showing Name, Call and QTH of the station or stations worked or heard, one dollar, U.S. ($1.00) to cover postage and printing costs. Payment may be made in cash, check, money order, IRCs or USA postage stamps. For DX applicants,

Rugged...compact (10"x17.5"x4.5")...lightweight (17.5 lbs.)

An extraordinary world of DX from your mobile station with the

All Solid State METRON® MA1000B

No tuning or adjustment whatever over 160, 80, 40, 20 and 15 meters

- For direct use with standard automobile battery/alternator
- Base station with optional 13.6V power supply
- Fully remote controlled
- Suitable for use with any transceiver in the 100W class
- Heatsink convector-cooled and thermostatically controlled
- 8 power transistors of latest stripline RF linear devices; rated for operation at infinite VSWR
- Meets all applicable specifications

Power input	13.6V DC 1000W
Power output	13.6V DC 600W PEP typical
Harmonics	−50dB all amateur bands
Drive level	60W PEP 50 ohms

Available from stock
Dealer inquiries invited

MAGNUS
ELECTRONICS CORPORATION
5715 Lincoln Avenue, Chicago, Illinois 60659
Phone (312) 334-1502 • Telex 253503 MAGNUS CGO

CIRCLE 30 ON READER SERVICE CARD

new COAX SWITCHES
from Barker & Williamson

Model 593

- ***Single Pole*** 3 Position with grounding of all unused positions
- ***Crosstalk*** (measured at 30 MHz) is -45db between adjacent outlets and 60 db between alternate outlets

Model 594

- ***2 Pole 2 Position***
- ***Crosstalk*** 45db (measured at 30 MHz)

Specifications for both switches

- ***Power*** 1 KW-2 KW PEP
- ***Impedence*** 50-75 ohms
- ***VSWR*** 1.2:1 up to 150 MHz
- ***Dimensions*** 1¾" high, 5" wide, 3" deep
- ***Weight*** 1 lb.
- ***Mount*** Wall or desk

Available at your B&W dealer

B&W
Barker & Williamson, Inc.
10 Canal St. Bristol, Pa. 19007
Telephone: (215) 788-5581

CIRCLE 2 ON READER SERVICE CARD

PASS FCC EXAMS

The Original FCC Tests-Answers Exam manual that prepares you at home for FCC First & Second class Radiotelephone licenses. You get the complete set of 15 newly revised multiple-choice examinations- covering all areas tested on the actual FCC exam. Also included--helpful study tips, short cuts, and "Self-Study Ability Test." These updated FCC Tests-Answers take the mystery out of preparing for current FCC exams. Practical proven Material. $9.95 postpaid. Unconditional Moneyback Guarantee.

COMMAND PRODUCTIONS
RADIO ENGINEERING DIVISION
P.O. BOX 26348-C SAN FRANCISCO, CA 94126
Please rush me Tests-Answers for FCC First and Second Class Commercial License. My $9.95 is enclosed.
Name _____
Address _____
City _____ State ___ Zip ___

USA-CA Honor Roll

3000		2000		1000	
WA9OBR	262	WA9OBR	372	WA9OBR	547
K1VSJ	263	WB5NFS	373	WD0EMS	548
KB5KM	264	KB5KM	374	KB5KM	549
2500		**1500**		**500**	
WA9OBR	326	WA9OBR	428	WA9OBR	1366
KB5KM	327	WD9BCG	429	WB9GCU	1367
		KB5KM	430	WD0EMS	1368
				WD8OWA	1369
				KB5KM	1370

please send three (3) IRCs to: Gary Lorenz, Awards Manager MMARC, 3210 N. County Line Road, Farwell, Michigan 48622. *Note:* Contacts may be made over any period of time, so dig back through your logs. Repeater contacts can not be used, but satellite contacts are OK. Request any special endorsement. Please do not send QSL cards, but photocopies of QSLs will be accepted.

So familiar is the White Tail to Americans that we need no detailed description of their size, speed or of their grace.

The deer change color with the seasons. From a reddish brown in the summer to a grayer, rougher looking coat in the winter.

In any season, the underside of the plumelike triangular tail is snow-white. When the deer runs, his tail is erected and the white undertail marking waves like a flag.

The population of the White Tail in Michigan was not very large before the lumberman came along with his axe and crosscut saw, but following the great lumbering era of the past century, young forest growth came up everywhere in Northern Michigan, and the White Tails increased in numbers correspondingly. During the spring, summer and fall months, the White Tails roam freely over the countryside, finding food almost everywhere. But in the winter months when the snow is deep, deer cannot get around through the open country and they are confined to so-called "yards" in the dense woods and swamps. Here they must eat what is at hand and here it is that starvation sometimes faces them.

The gestation period of the White Tail is about seven months and the young are born usually in May and June. Twins are quite common. The fawns are pretty little spotted fellows and the spots remain visible for several months.

The White Tail is indeed a beautiful sight whether they are just browsing or running with their "flags" up. Many persons enjoy seeing the deer throughout the year when they travel the roads and trails of Michigan.

The Bull Award: In order to make the province of Dalsland, Sweden better known and to increase the activity with the hams in the region, the Mellerude Radio Club (SK6CM) has decided to issue this award. Points required are: Amateur radio stations in LA, SM, OH and OZ = 10 points. Other European stations need 5 points, stations outside Europe need 2 points.

Every QSO with a radio amateur living (resident) in DALSLAND = 1 point. QSO with SK6CM = 2 points. Contacts on frequencies above 144 MHz double the points (2 and 4 respectively). All bands and modes are allowed, but only one QSO with each station counts. QSOs as of January 1st, 1979 are valid. Repeater or satellite traffic is not approved.

Application for the award can be made on plain paper and must contain Call signs of stations worked, date, time (GMT), band, mode and the applicants own call sign, name and address. No QSLs are required.

The fee, 20 Sw. cr. or 5 U.S. Dollars, should be sent with the application and preferably via MRC Postal Giro account nr 86 38 89-2. The Bull Award can also be achieved by SWLs, but in that case the necessary QSL cards must be enclosed.

The application form must be signed by the applicant, certifying on honor and conscience that the valid rules have been followed and sent to: The Mellerude Radio Club, 464 00 Mellrud, Sweden. Here is a list of amateur callsigns, residents in Dalsland as of April 1979:

SK6CM, SM6AGW, SM6ALJ, SM6AMU, SM6ASJ, SM6AWZ, SM6BER, SM6BGG, SM6BLE, SM6BOT, SM6BPX, SM6CGI, SM6CJK, SM6CLX, SM6CMK, SM6CNC, SM6COY, SM6COZ, SM6CQK, SM6CUA, SM6CWK, SM6CYU, SM6DKU, SM6DXY, SM6EOI, SM6EPA, SM6ESW, SM6EUC, SM6EUT, SM6FCM, SM6FFK, SM6FLR, SM6FNE, SM6GAS, SM6GDP, SM6GMR, SM6GQJ, SM6HQZ, SM6HRL, SM6IHF, SM6JJZ, SM6JKB, SM6JMA, SM6JOD, SM6JOG, SM6JOM, SM6JOO, SM6JQA, SM6JRB, SM6JRY, SM6JUJ, SM6KFA, SM6KFB, SM6KFF and SM6ST.

Notes

Hope most of you know that *All CQ* Awards now cost $5.00 and the Plaques cost $30.00. All but USA-CA jumped to $5.00 June 1, 1979 but USA-CA waited until September 1.

I just hung up the telephone after talking with John, K4ISF who just made them All, more data on him later. How was your month?

73, Ed., W2GT.

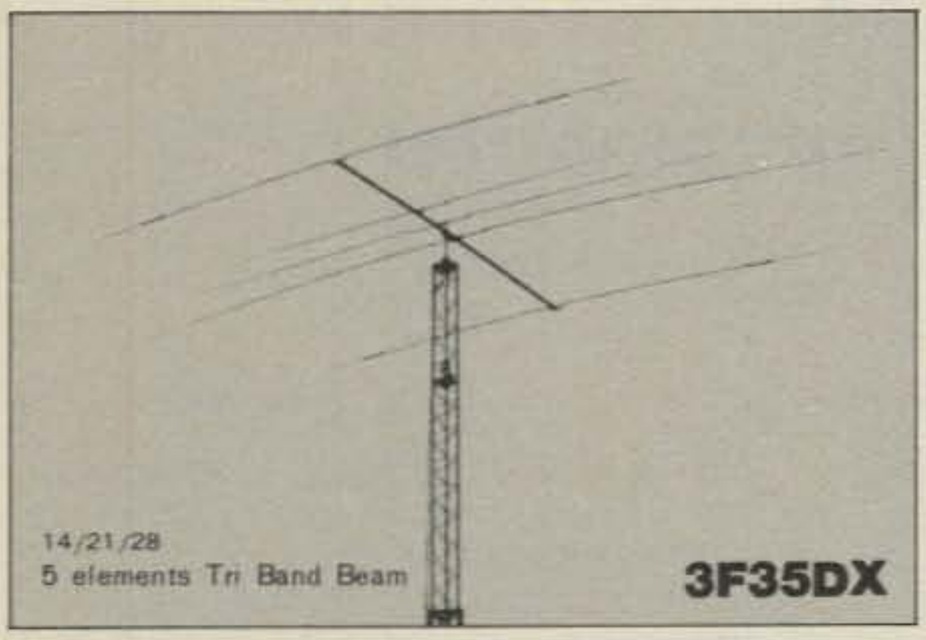
Please send all reader inquiries directly

TET®

ANTENNA SYSTEMS

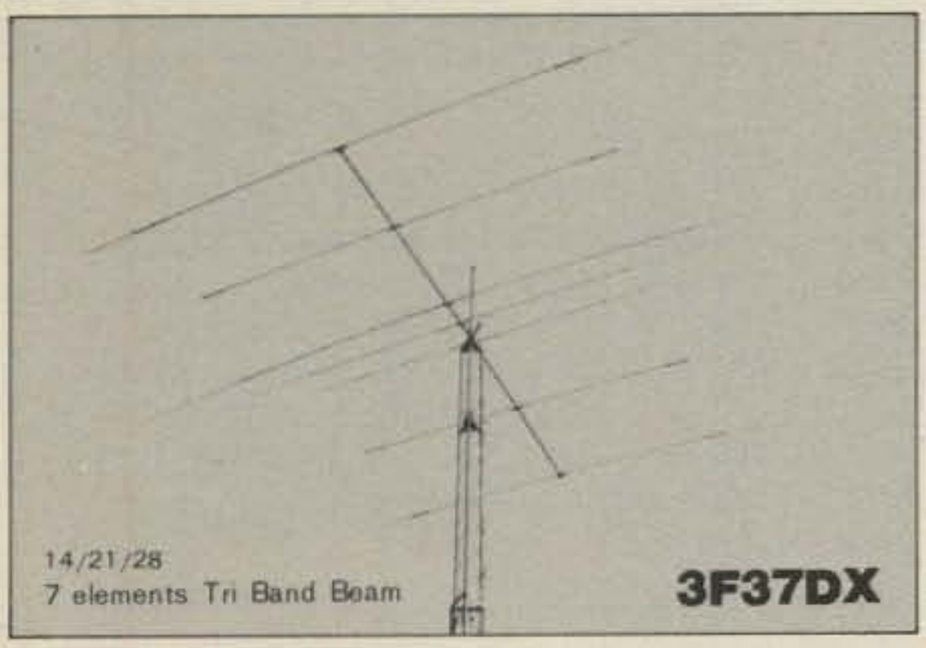
Multi Band Beam Super DX Series

NEW HIGH PERFORMANCE TRI-BAND BEAMS AS GOOD AS FULL-SIZE MONO BAND ANTENNAS.
These beams employ hybrid system which is a combination of separated full-size driven element for each band individually and Hi-Q trap parastic elements. These feature result high radiation efficiency, high power rating and excellent VSWR in entire band width.



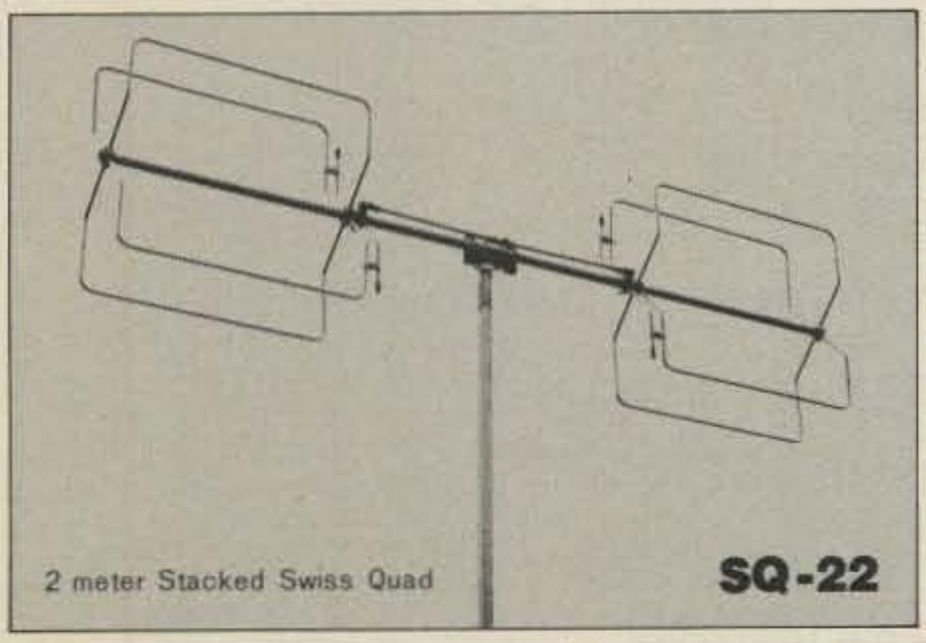
14/21/28
5 elements Tri Band Beam

3F35DX



14/21/28
7 elements Tri Band Beam

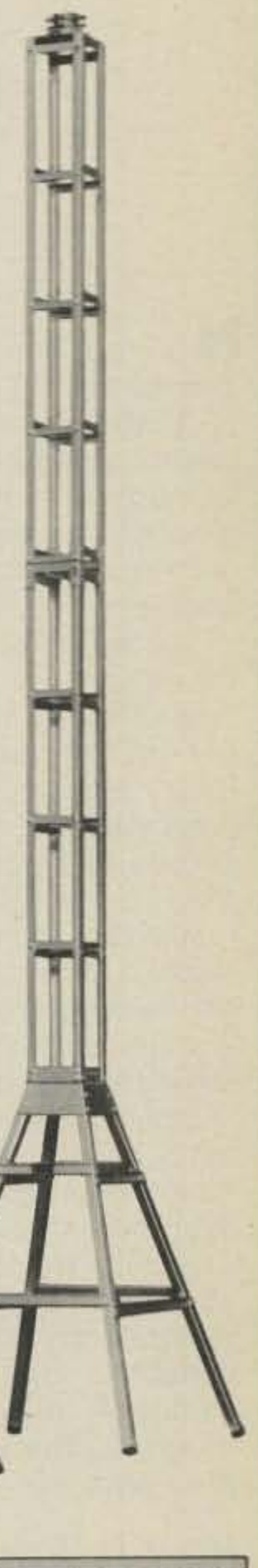
3F37DX



2 meter Stacked Swiss Quad

SQ-22

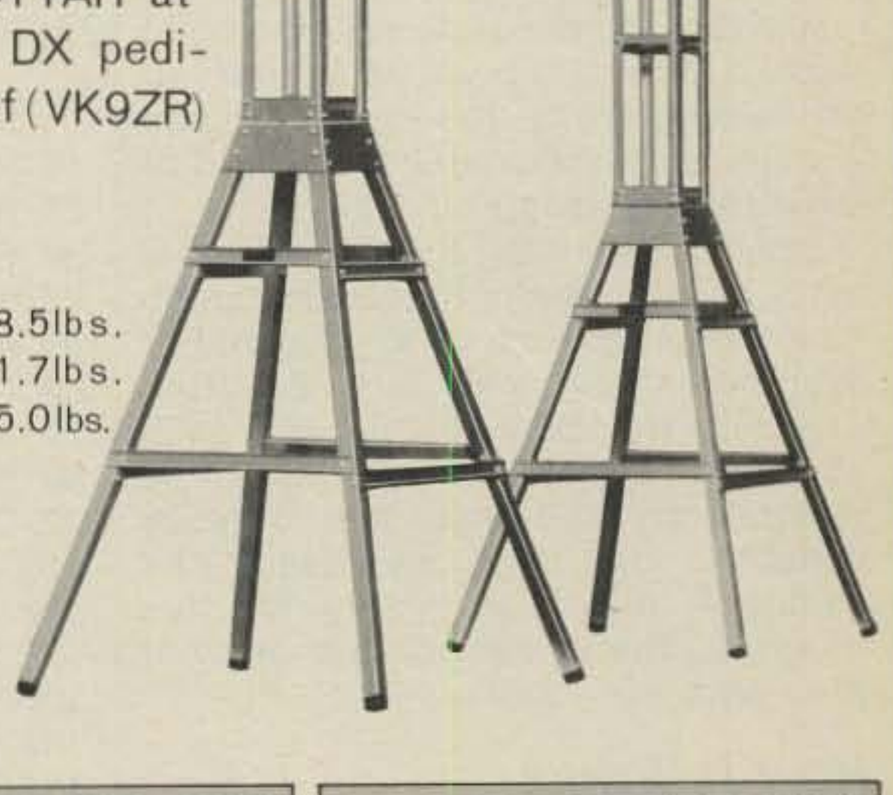
TET ORIGINAL
MODULAR ANTENNA TOWERS
Ideal for roof & ground mounts



- one man assembly and installation
- Light weight
- High quality aluminum alloy
- High stability (square tubings are used as base section)

Has been used by JD1YAH at Ogasawara island and DX pedi-tionning at Melish Reef (VK9ZR)

Model	TE-35A	11.6ft.	48.5lbs.
Model	TE-55B	18.0ft.	61.7lbs.
Model	TE-75C	25.0ft.	75.0lbs.



KR-2000

KR 2000—Designed for 360° rotation. Brake holds up to 10,000kg/cm (8680lbs/inch) torque.

KR-600

KR 600—Designed for360° rotation. Brake holds up to 4000 kg/cm (3470 lbs/inch) torque.

KR-400

KR 400—Designed for 360° rotation. Rated to support up to 200 kg or 440 lbs. Read out tolerance ±5 degree max

KR-500

KR 500—Designed for 180° rotation. Brake holds up to 2000 kg/cm (1750 lbs/inch) torque.

425 Highland Parkway, Norman, Oklahoma 73069
Tel. (405) 360–6410

TET U.S.A., INC.

CIRCLE 51 ON READER SERVICE CARD

Here's a neat way of storing and cataloging computer programs on a cassette tape.

Cassette File Directory Program

For The TRS-80 Level I Microcomputer

BY TERRY KEPNER*

No too long after acqiring my TRS-80 Level I microcmputer, I realized that even at the slow rate of 250 baud it was possible to store a dozen or more programs on one tape. Unfortunately, on the cassette label there is room for only two or three program names.

To overcome this liability, I wrote this short program that goes at the beginning of the tape. It contains a list of the various program names, their size in the computer RAM (kilobytes), and their beginning and ending positions on the tape (according to the tape counter). This information is stored in data statements at the end of the program. Each time you add a program to the tape, just add another data statement to the end of the directory program.

Level I Basic for the TRS-80 contains several restrictions which can be troublesome in long programs. For example there are only 2 string variables (A$,B$) available and each string is limited to a maximum of 16 characters. Also there are only 26 variables that can be used (the alphabet, A-Z). Fortunately for this program, these restrictions are not problems.

How It Works

This program is fairly straight forward. The only variables used are:

A : used as a line counter to prevent scrolling
B : used to read and print the memory size of the program
C : used to read and print the program tape start position
D : used to read and print the program tape stop position
Y=1 : inputting Y is the same as inputting 1, means *yes*
N=O : inputting N is the same as inputting O, means *no*
Z : used as a dummy variable
A$,B$: used as strings to store program name

When the program is RUN, the page headings are printed on the first three lines, then the data statements are read. Each time a data line is read, a check is made for the end of file flag. The flag is stored in the variable B as a 0. B is used as the storage variable for the beginning tape position of each program. Because of this it cannot be zero in normal operation. Only for the first program could it be zero, and if a little bit of leader is left on the tape then the first program will not be starting at zero.

If B is equal to zero then the program prints A$, which says "END OF FILE" and then asks if the operator wants to reprint the file. If not, then it ENDs the run.

If B is not equal to zero, then the data statement is printed, and the line counter is incremented by one. When the counter reaches eleven, the program halts and asks the operator to enter a one to continue the listing. When it gets the one entered, it contains listing the next eleven lines, or until EOF.

*1602 S. Avenida Sirio, Tucson AZ 85710

```
10 REM      DIRECTORY PROGRAM—JAN 79
20 REM
30 REM      BY TERRY KEPNER
40 REM      1602 S, AVENIDA SIRIO
50 REM      TUCSON, ARIZONA 85710
60 REM
70 REM      WRITTEN FOR THE TRS-80 LEVEL I MICROCOMPUTER
80 REM      PRINT HEADINGS**********
90 CLS : P.TAB(15);"DIRECTORY FILE - - SIDE ONE"
100 P.TAB(50);"TAPE POSITION"
110 P.TAB(5);"PROGRAM NAME";TAB(40);"SIZE";
120 P.TAB(50);"START";TAB(59);"STOP"
130 REM      INITIALIZE PROGRAM VARIABLES*******
140 A=0 : Y=1 : N=0 : Z=1
150 REM      READ DATA STATEMENTS*************
160 READ   A$,B$,B,C,D
170 REM      CHECK B FOR END OF FILE FLAG******
180 REM      THEN CHECK FOR END OF PROGRAM*****
190 IFB=0P. :P.A$,:IN."REPRINT FILE";Z:IFZ=1RESTORE:G.10
200 IFZ=0END
210 REM      PRINT THE DATA STATEMENT**********
220 P.A$;B$;TAB(38);B;"K";TAB(50);C;TAB(58);D
230 REM      CHECK FOR FULL SCREEN (11 LINES ADDED)*****
240 REM      IF IT IS FULL, THEN WAIT UNTIL TOLD TO CONTINUE*****
250 IFA=11IN."      TYPE 1 TO CONTINUE LISTING";Z:A=0:G.90
260 A=A+1 : G.160
990 REM      DATA STATEMENTS (PROG. NAME,SIZE,START POS.,STOP POS.)
1000 DATA DIRECTORY FILE, ,.860,007,30
  •
  •
9000 DATA      END OF FILE,0,0,0,0
```

FOR THE EXPERIMENTER

INTERNATIONAL CRYSTALS & KITS/OSCILLATORS • RF MIXERS • RF AMPLIFIER • POWER AMPLIFIER

OX OSCILLATOR

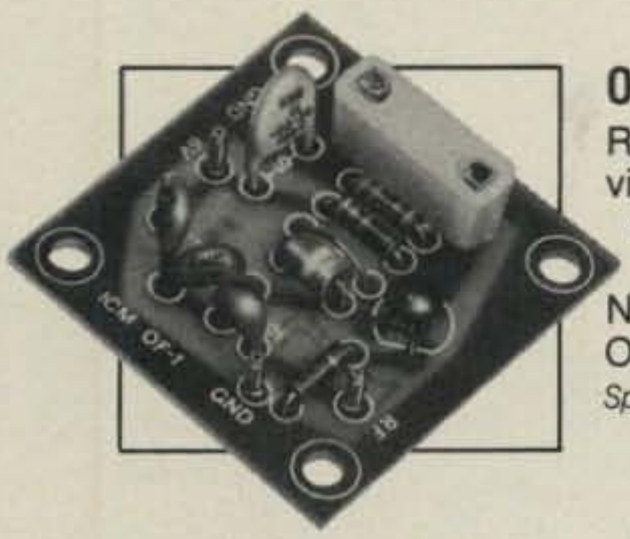
Crystal controlled transistor type. 3 to 20 MHz, OX-Lo, Cat. No. 035100. 20 to 60 MHz, OX-Hi, Cat. No. 035101.

Specify when ordering. $5.22 ea.

MXX-1 TRANSISTOR RF MIXER

A single tuned circuit intended for signal conversion in the 3 to 170 MHz range. Harmonics of the OX or OF-1 oscillator are used for injection in the 60 to 179 MHz range. 3 to 20 MHz, Lo Kit, Cat. No. 035105. 20 to 170 MHz, Hi Kit, Cat. No. 035106.

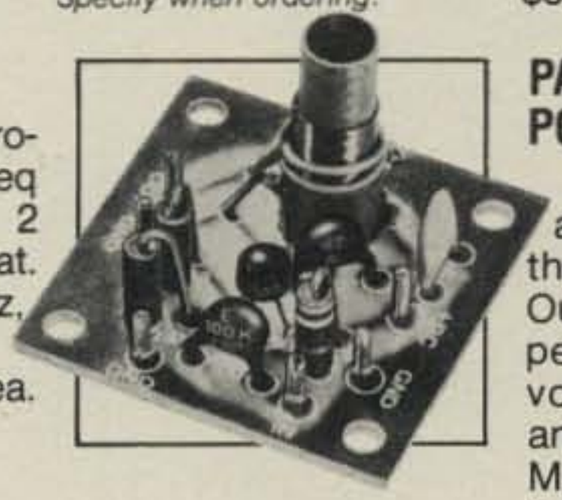
Specify when ordering. $5.80 ea.



OF-1 OSCILLATOR

Resistor/capacitor circuit provides osc over a range of freq with the desired crystal. 2 to 22 MHz, OF-1 LO, Cat. No. 035108, 18 to 60 MHz, OF-1 H Cat. No. 035109.

Specify when ordering. $4.48 ea.



PAX-1 TRANSISTOR RF POWER AMP

A single tuned output amplifier designed to follow the OX or OF-1 oscillator. Outputs up to 200 mw, depending on frequency and voltage. Amplifier can be amplitude modulated 3 to 30 MHz, Cat. No. 035104.

Specify when ordering. $6.06 ea.

SAX-1 TRANSISTOR RF AMP

A small signal amplifier to drive the MXX-1 Mixer, Single tuned input and link output. 3 to 20 MHz, Lo Kit, Cat. No. 03512. 20 to 170 MHz, Hi Kit, Cat. No. 035103.

Specify when ordering. $5.80 ea.

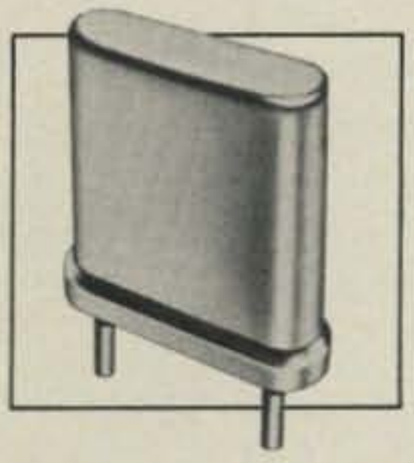
BAX-1 BROADBAND AMP

General purpose amplifier which may be used as a tuned or untuned unit in RF and audio applications. 20 Hz to 150 MHz with 6 to 30 db gain. Cat. No. 035107.

Specify when ordering. $6.06 ea.

.02% Calibration Tolerance

EXPERIMENTER CRYSTALS (HC 6/U Holder)



Cat. No.	Specifications	
031080	3 to 20 MHz — for use in OX OSC Lo	
	Specify when ordering	$6.25 ea.
031081	20 to 60 MHz — For use in OX OSC Hi	
	Specify when ordering	$6.25 ea.
031300	3 to 20 MHz — For use in OF-1L OSC	
	Specify when ordering	$5.22 ea.
031310	20 to 60 MHz — For use in OF-1H OSC	
	Specify when ordering	$5.22 ea.

Shipping and postage (inside U.S., Canada and Mexico only) will be prepaid by International. Prices quoted for U.S., Canada and Mexico orders only. Orders for shipment to other countries will be quoted on request. Address orders to: M/S Dept., P.O. Box 34297. Oklahoma City, Oklahoma 73132

ICM

INTERNATIONAL CRYSTAL MFG. CO., INC.
10 North Lee / Oklahoma City, Okla. 73102

CIRCLE 33 ON READER SERVICE CARD

TS-180S SERIES

TL-922A

SM-220

For the ultimate in quality and performance

TS-180S with DFC*

All solid-state, this innovative 160-10 meter SSB/CW/FSK transceiver with DFC (*Digital Frequency Control) includes four memories which can be digitally tuned up or down in 20-Hz steps, slow or fast, by means of memory-shift paddle switches. The original stored frequency can be recalled, and the newly tuned memory frequency can also be stored. The memories are usable in transmit, receive, and transceive modes. It's like having four remote VFO's, but with even more flexibility. Separate VFO and memory RIT controls are provided. The solid-state final requires no dipping or loading, and runs up to 200 watts PEP input. It covers 50 kHz above and below each band (100 kHz with the tunable memories) and is adaptable for three new bands (to be considered at WARC). The built-in microprocessor-controlled digital display shows the actual VFO frequency, or the fixed-channel frequency, or the remote VFO frequency (if the optional VFO-180 is used), and it also shows the RIT frequencies. When a frequency is stored in the "M1" memory, the digital display can be switched to indicate the stored frequency and the difference between the stored and VFO frequencies simultaneously. Other features include IF SHIFT, selectable CW receive bandwidths, tunable noise blanker, RF AGC, and improved RF speech processors. Optional accessories, besides the VFO-180 remote VFO, include the DF-180 Digital Frequency Control; SP-180 external speaker; YK-88SSB SSB filter; YK-88CW CW filter; AT-180 antenna tuner/SWR and power meter/antenna switch; PS-30 base station power supply (turns on and off remotely with TS-180S power switch); MC-50 base station microphone, and HS-4 head phones.

TL-922A

Linear amplifier for 160-15 meters runs maximum legal power with 80 watts or more drive. RF input power is 2000 watts PEP on SSB and 1000 watts DC on CW and RTTY. Features include variable threshold level ALC, turn-off delay circuit for blower, and hefty construction.

SM-220

Station monitor combines a wideband (10 MHz) oscilloscope and built-in two-tone generator to monitor all transmitted and received waveforms. It also shows a trapezoid pattern for checking linearity. Pan-display option allows observing number of signals in ±20 or ±100 kHz band segments.

Specifications for Model TS-180S

	Model TS-180S
Frequency Range:	160m 1.80-2.00MHz 80m 3.50-4.00MHz 40m 7.00-7.30MHz 20m 14.00-14.35MHz 15m 21.00-21.45MHz 10m 28.00-29.70MHz WWV 10.00-10.50MHz (receive only)
Modes	SSB (LSB and USB)/CW/FSK
Power Requirements:	R: 13.8 VDC, 1.8 A T: 13.8 VDC, 20 A
Final Power Input:	160-15m 200 W PEP (SSB) 160 W DC (CW) 100 W DC (FSK) 10m 160 W PEP (SSB) 140 W DC (CW) 100 W DC (FSK)
Audio Input Impedance:	500Ω-50kΩ
RF Output Impedance:	50Ω
Frequency Stability:	Within 100Hz during any 30-min. period after warmup. Within ±1kHz during first hr. after 1 min. warmup.
Carrier Suppression:	Better than 40dB
Sideband Suppression:	Better than 60dB
Spurious Radiation:	Better than 50dB
Harmonic Radiation:	Better than 40dB
Audio Frequency Response:	400-2600Hz, within -6dB
Receiver Sensitivity:	0.25μV at 10dB S/N
Image Ratio:	Better than 60dB
IF Rejection:	Better than 80dB
Receiver Selectivity:	SSB, CW Wide: 2.4kHz (-6dB) 4.2kHz (-60dB) *CW Narrow, FSK: 0.5kHz (-6dB) 1.8kHz (-60dB) *(CW Filter Option)
Audio Output Impedance:	4-16Ω
Audio Output:	2W (4Ω)
Dimensions:	13-1/2 (343)W x 5-11/14 (147)H x 14-3/10 (363)D in. (mm) (Inc. heat sink, knobs, etc.)
Weight:	11.5 kg (25.35 lbs.)

See your Authorized Kenwood Dealer for complete information.

KENWOOD

...pacesetter in amateur radio

TRIO-KENWOOD COMMUNICATIONS INC.
1111 WEST WALNUT, COMPTON, CA 90220

KENWOOD'S TR-2400

...synthesized, BIG LCD, 10 memories, scanning...and more!

Kenwood TR-2400...it's a synthesized 2 meter hand-held transceiver...the answer to any Amateur's operating requirements! Its many advanced features include:

CONVENIENT TOP CONTROLS

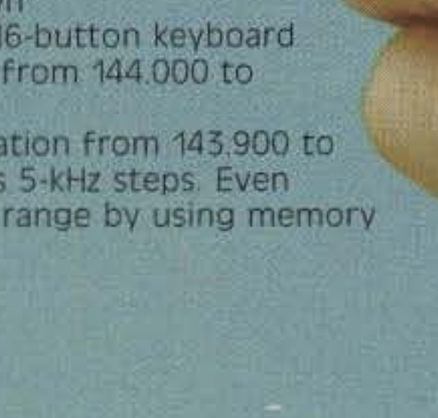
- **LCD digital readout**
- Readable in direct sunlight (better than LEDs)
- Readable in the dark (with lamp switch)
- Virtually no current drain (much less than LEDs) and display stays on
- Shows receive and transmit frequencies and memory channel
- **10 Memories** (always retained with battery backup)
- **Automatic memory scanning** (for "busy" or "open" channels)
- **Mode switch for the following operations:**
- Simplex
- Standard repeater by offsetting the transmit frequency + 600 kHz or − 600 kHz
- Repeater with nonstandard splits by offsetting the transmit frequency to any frequency stored in memory 10
- **REVERSE** momentary switch for the following applications:
- Checking signals on the input of a repeater
- Determining if a repeater is "upside down"
- **Built-in Touch-Tone generator** using 16-button keyboard
- **Keyboard selection** of 5-kHz channels from 144.000 to 147.995 MHz
- **UP/DOWN manual scanning** and operation from 143.900 to 148.495 MHz in single or fast continuous 5-kHz steps. Even operates on MARS repeaters within this range by using memory 10 for transmit offset frequency.
- **LCD "arrow" indicators**
- "ON AIR"
- Memory recall
- Battery status
- Lamp switch on
- **Two lock switches** to prevent accidental frequency change and accidental transmission
- **Subtone switch** (subtone module not Kenwood-supplied)
- **BNC antenna connector**
- **1.5 watts RF output**

The TR-2400 comes with the following standard accessories:

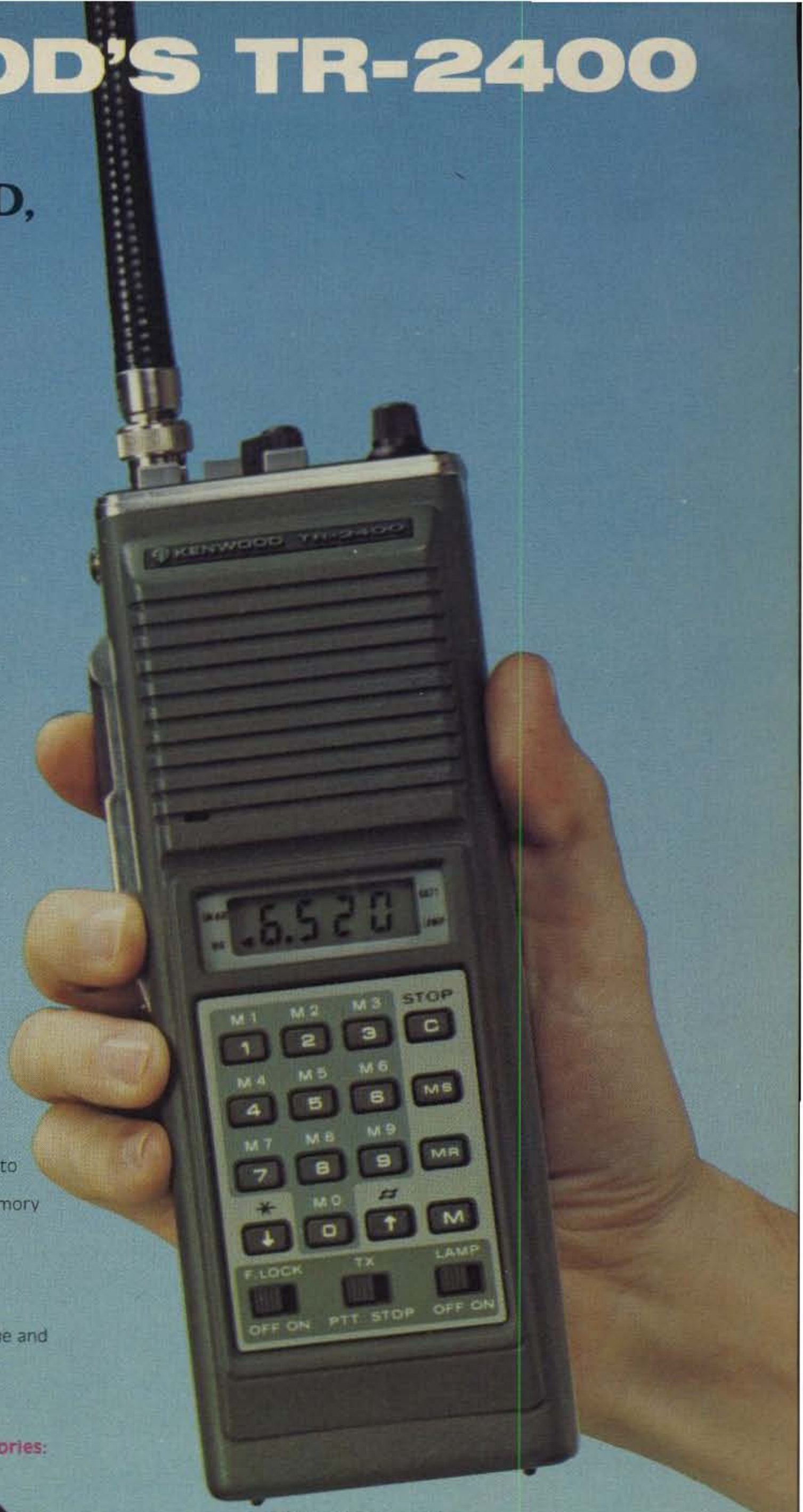
- Flexible rubberized antenna with BNC connector
- Nicad battery pack
- Battery charger

Optional accessories include:

- Leather case
- Base Stand (for quick charge and easy base-station operation)
- DC (automobile) quick charger



ST-1 BASE STAND (OPTIONAL)



(Subject to FCC approval)

SEE YOUR AUTHORIZED KENWOOD DEALER FOR MORE INFORMATION ON THE TR-2400.

KENWOOD

...pacesetter in amateur radio

TRIO-KENWOOD COMMUNICATIONS INC.
1111 WEST WALNUT/COMPTON, CA 90220

Swan's Success Story:

100MX Power House

The Field-Proven Rig the Whole World's Talking About.

235 Watt PEP and CW on **ALL** Bands

Price? You won't believe it! Just ask your dealer.

All solid state quality American construction, with epoxy glass boards to withstand the rugged mobile environment.

Look to Swan for Quality Accessories . . . and Service

SWAN ELECTRONICS
A member of the Cubic Corporation family of companies

305 Airport Road
Oceanside, CA 92054
714-757-7525

CIRCLE 45 ON READER SERVICE CARD

From the workbench of Ade Weiss springs another goodie guaranteed to give you hours of enjoyment.

A Two-Band V.F.O. For 80 And 40 Meters

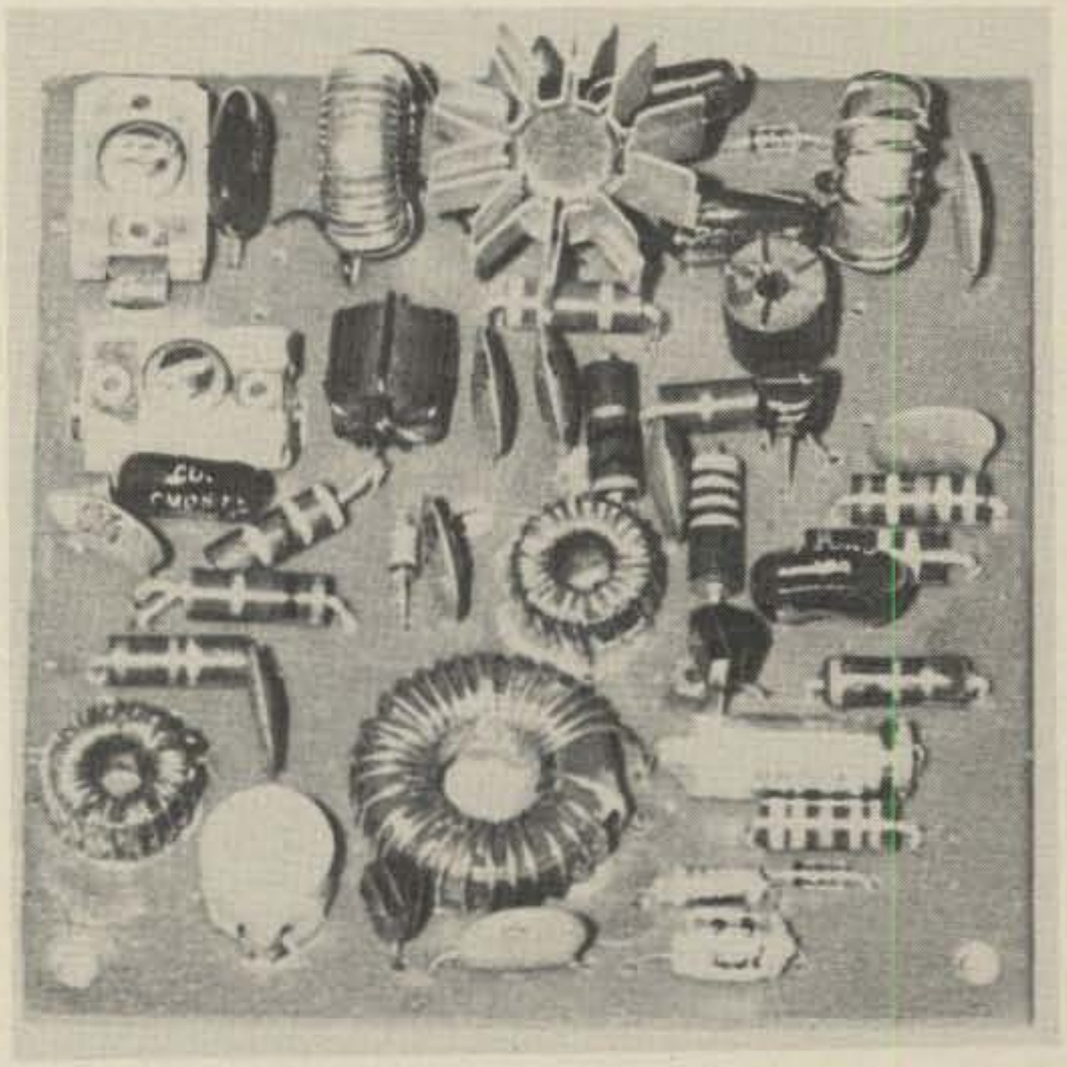
BY ADRIAN WEISS *K8EEG/W0RSP

In an earlier article, we described a two-band 5 watt transmitter called the Viking-5 which is capable of operation on both 3.5 and 7 MHz with bandswitching.[1] The logical step was to go ahead and design a two-band v.f.o. capable of driving the Viking-5 on both bands so that when the two units are combined, a complete ORPp v.f.o.-transmitter of small size results. This article describes just such a two-band v.f.o. designed specifically with the Viking-5 in mind. It features switchable high-output on both bands, stability, Varactor diode tuning, and small size. The p.c. board design makes little attempt at miniaturization, so that the project is within the reach of the beginner, as is the case with the Viking-5. The combination would be an excellent beginner's project for someone desiring to move into QRPp operation as well as master the techniques of solid-state construction.

Vackar V.F.O. Circuit

Fig. 1 shows the circuit of the two-band v.f.o.. The v.f.o. oscillator section is comprised of an FET oscillator Q1 followed by a buffer-amplifier stage Q2. Varactor diode tuning is utilized for frequency control. The oscillator section is followed by the multiplier-amplifier section consisting of T1-Q3. Output from Q3 is fixed-tuned.

Q1 is used in a Vackar oscillator configuration which is quite stable when reasonable care is taken with parts selection and board design. The B+ line is isolated from the buffer-amp and multiplier-amp stages by means of the voltage dropping resistor R4 and RFC3-C6. Isolation is essential in achieving minimal interaction between oscillator and later stages which could result in frequency "pulling." To insure stability with respect to supply voltage variations, the B+ to the oscillator is regulated by means of a 9.1 volt zener diode (D2). The control voltage for the Varactor diode tuning system likewise is taken from the zener regulated voltage for the same reason. The values shown in Fig. 1 provide about 110 kHz frequency spread at 3.5 MHz. However, should the builder desire to change the oscillator frequency to 7 MHz for combined 7-14 MHz operation, the values of the frequency determining circuitry, consisting of L1-C1-C2-C3-C5 can be scaled down appropriately. C3 should be about 270 pf to provide the 110 KHz spread with the oscillator on 7 MHz. Polystyrene capacitors are used in this frequency determining part of the circuit because of their superior stability with respect to thermal variation, but silver micas could be used also. If temperature compensation is desired, and NPO or N750 discceramic of the proper size (deter-



Top view of the complete unit. Bottom half of the board is occupied by (1-r) the Varactor tuning circuit and Q1 oscillator components; the top half (1-r) by the L3-output tuning capacitors, Q3, and the T1 section, with the Q2 stage beneath T1. In more detail, to the left of L1 can be seen VR1 (at 7 o'clock) C4 frequency-set trimmer, RFC1 and above RFC1 is R2-C8, R4, C20, and R11. Above L1 (11 o'clock) is D2-C6, RFC3, and Q1 and 2 o'clock. Directly beneath L3 is C3, and the frequency determining section, from bottom edge up, C1, C5, D1, C2 R3, coupling capacitor C7, R6, R7-C9, With Q2 and R5 to the left of R7-C9. Directly above Q2 and partially osbcured is R8, with RFC5 just above Q2. Upper right corner (r-1) is C10, T1, C13, with D3 between T1 and heatsink, and C12 at top edge under heatsink. Directly below Q3 heatsink is R9, C14, C14, and R10. To the left of Q3 is RFC4 (8 o'clock) L3, C16-17, and below that is C18-19.

*83 Suburban Estates, Vermillion, SD 57069

[1] *Weiss, Adrian, "The Viking-5: A 5 Watt Solid State Transmitter for 3.5 and 7 MHz", QRP Column, CQ, Feb. 1979, page 40.*

Fig. 1- The circuit for the 3.5 and 7 MHz Vacker v.f.o.

Parts Notes:

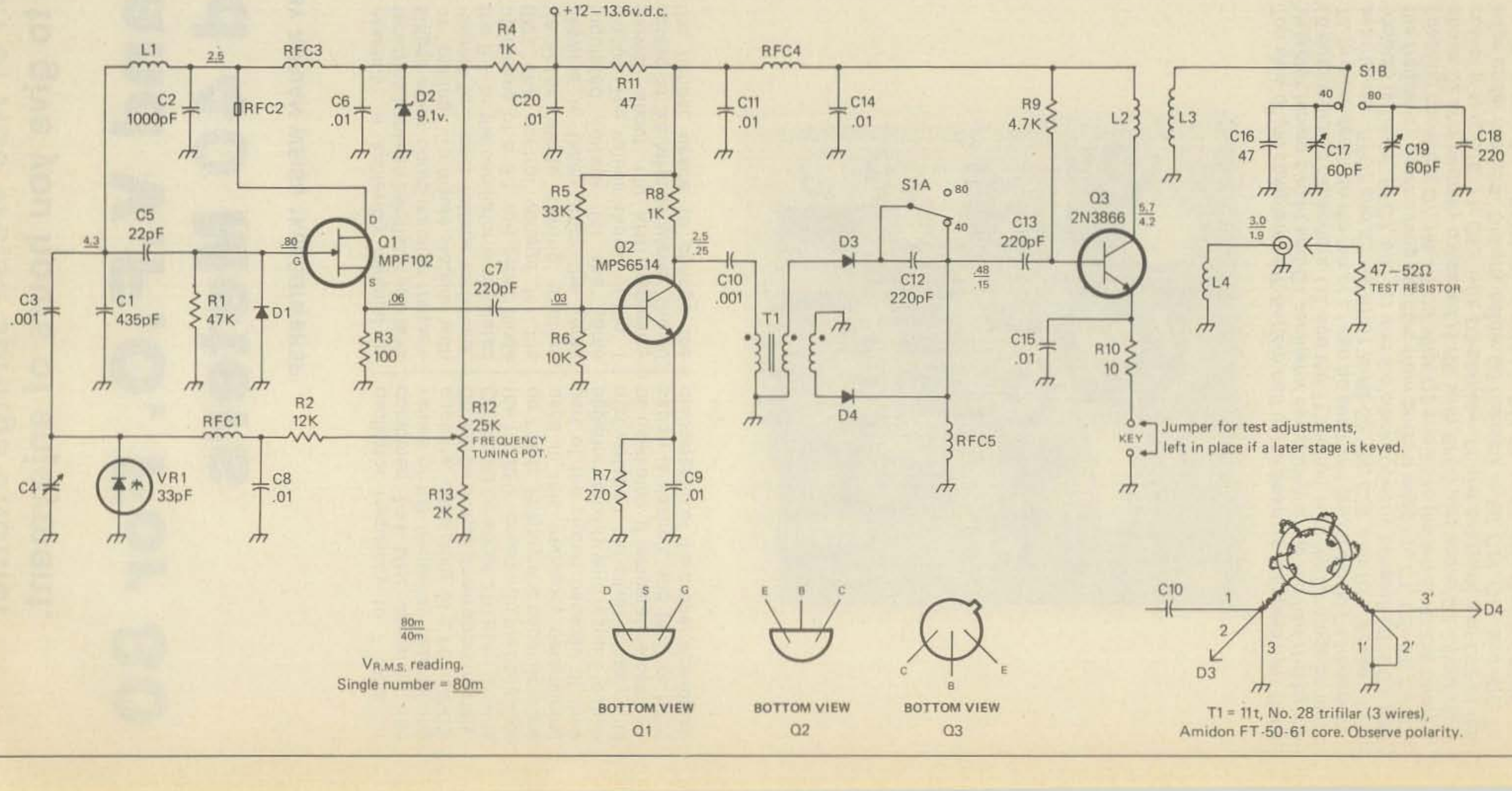
RFC-1	- 3lt. #28, FB-43-2401 core.
RFC-2	- FB-73-101 ferrite bead over drain lead of Q1.
RFC-3	- 25t. #28, FB-43-2401 core.
RFC-4	- 8t. #24, FB-73-801 core.
RFC-5	- 5t. #28, FB-73-801 core.
D1-3-4	- 1N914 Switching diode (or equiv.).
D2	- 1N757 9.1 v zener (or equiv.).
VR1	- 33 pf Varactor tuning diode, R-2503/MV2109.
C1-2-5 C7-12,13 16-18	- Polystyrene capacitor.
C4	- Silver mica capacitor.
C17-19	- 30 pf trimmer.
R12	- 60 pf trimmer (Elmenco 404).
L1	- 25K linear taper potentiometer.
L2	- 32t. #22, T-68-2 core.
	- 4t. #24, 1/3 core at "hot" end of L3
L3	- 40t. #26, T-50-2 core.
L4	- 2t. #24, ground end of L3.

Parts Sorces:

Toroid Cores - Amidon Associates
12033 Otsego St.
N. Hollywood,
CA 91607

Polystyrene Capacotors - Digikey Corp.
P.O. Box 677
Hiway 32 South
Thief River Falls,
MN 56701

Other Parts - Circuit Specialists Co.
P.O. Box 3047
Scottsdale,
AZ 85257



mined experimentally by substitution) can be paralleled with C1.

Drive to Q2 is taken across a 100 ohm resistor at the source of Q1 through a non-critical 220 pf silver mica, although a wide variation in this value is tolerable. Q2 is a standard Class A buffer-amplifier and it, as well as later stages, are further isolated from the oscillator through the dropping resistor R11 and C11. Output to the diode doubler is taken from the collector of Q2, providing a high input to the doubler which is necessary to offset the loss through the doubler.

Diode Multiplier-Amplifier Stage

Two-band operation is made possible through the use of the passive diode frequency doubler at T1 whose output is then amplified by the tuned-output Q3 stage. The operation of the doubler circuit can best be illustrated by analogy to the familiar power supply full-wave rectifier circuit, where T1 is analogous to the center-tapped power transformer, D3-4 analogous to the rectifier diodes, and RFC5 analogous to the output filter capacitor. In the power supply filter operation, each diode permits passage of the a.c. current during one-half of the cycle, but because of the phase reversal occurring due to the center-tap of the transformer, both positive and negative swings of the input voltage appear on the positive side of the waveform zero line in the output. This "humpback" a.c. voltage charges the filter capacitor to the peak value of the a.c. voltage swing, and the capacitor maintains a constant d.c. voltage output. Now, in regard to the frequency doubling circuit, T1 provides the phase reversal necessary, and both positive and negative swings of the drive voltage are added in the output from the diodes, resulting in a frequency doubling. However, since an a.c. output is desired, the filter capacitor is replaced with RFC5 which completes the d.c. path while presenting a high reactance to the a.c. output of the diodes. Hence, both positive and negative swings of the input voltage appear in the output as positive swings. Each input cycle results in two output peaks, hence, a doubling of the a.c. input frequency. The doubling effect can be negated by the insertion of C12 which defeats the action of FRC5, allowing only the passage of each half cycle of a.c. input voltage to appear in the output, or, in other words, an output of the same frequency as the input. So, T1 may be left in the circuit for both fundamental and second harmonic operation, and adds to the interstage isolation, minimizing inteaction of the oscillator with the variations in load presented to Q2.

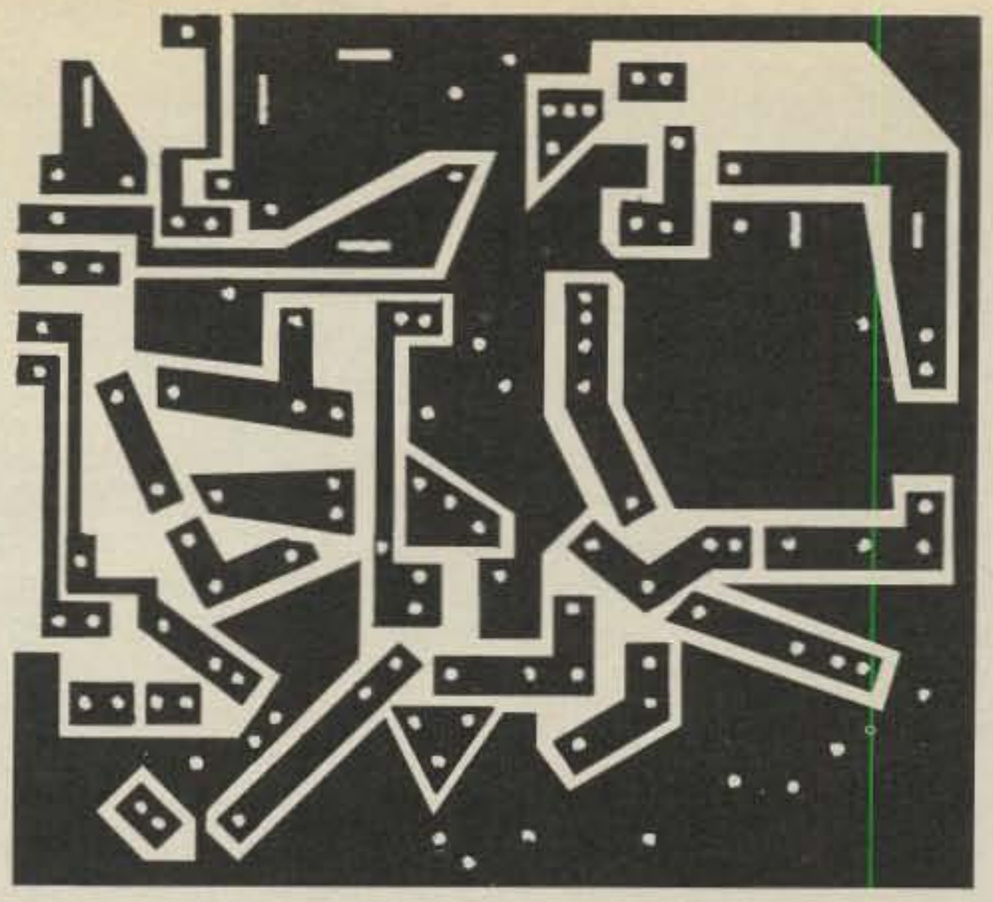


Fig. 2- Full size template for the 3.5 and 7 MHz v.f.o.

The Q3 amplifier stage is operated in Class B to avoid the harmonic content which characterizes Class C operation, while at the same time providing a reasonable efficiency figure. Proper biasing of the stage is important in order to maintain signal purity, although fundamental and third order products are below the desired output frequency by a quite acceptable margin. The output of the Class B amplifier is tuned by means of a switched L/C tank circuit. SW1b inserts the proper capacitance across L3 to peak the stage either at 3.5 or 7 MHz. Since this is a relatively narrow L/C tank circuit, a variation in output from Q3 appears across the 110 KHz v.f.o. frequency range. The output voltage will vary from 3 volt r.m.s. at center frequency to about 2.1 volts r.m.s. at each edge. However, this is more than adequate for driving the Viking-5 or similar transmitters to full output across the entire range. Output variation is lesser on 7 MHz. If the v.f.o. is to be used across a considerably greater frequency spread, the builder can substitute a panel-mounted variable capacitor for the trimmers shown at C17-19, and peak the output from the unit by means of that control.

Varactor Tuning System

The unit utilizes a Varactor diode as frequency tuning control. The advantage of this approach is that no frequency sensitive r.f. bearing leads leave the p.c. board, since the tuning control voltage is a d.c. voltage which is isolated from the frequency determining circuit by means of R2-C8-RFC1. The values shown are for 3.5-3.610 kHz. If the builder desires to place the unit on 7 MHz fundamental frequency operation, the value of C3 and VR1 can be varied in order to achieve an acceptable bandspread. Experimentation with the value of C3 should produce an accpetable result. Or, the R12-R13 control voltage divider can be varied. Increasing the value of R13 will decrease the bandspread achieved. R2 is non-critical The Varactor system may be eliminated if the builder wishes to use a variable capacitor as tuning control. In this case, a 35 pf air variable plus a suitable value C3 (determined experimentally) should be inserted in place of the varactor diode circuit.

P.C. Board

Fig. 2 shows the p.c. board design for the two-band v.f.o. The board uses single-clad p.c. stock and is a fairly uncomplicated layout. No attempt at miniaturization was made, and half-watt resistors are used throughout. Perhaps the only area which may cause some confusion is the mounting of T1. The ground leads mounting hole for T1 is almost directly under the toroid core, while the input and output leads are to the sides of the core. The L2-L3-L4 toroid may be wound before mounting on the board if attention is given to the proper placement of inductance mounting leads. Another approach which I would suggest is to first wind L3, and then mount the toroid in place without soldering the leads at this point. Then, begin the L2 winding by inserting the B+ end of L2 in its proper mounting hole, next wind L2 so

that the collector end of the winding leaves the core at about 1/3 of the circumference, and then mount the collector lead in its proper hole. L4 should be wound in the same fashion, and once completed, all leads can then be soldered to their respective foil strips. This approach "tailors" the windings and leads to suit the mounting-hole positions. C4, the frequency-set trimmer capacitor, may be of a different variety than the one shown, so be sure to match up the mounting holes with the mounting tabs of the actual C4 used.

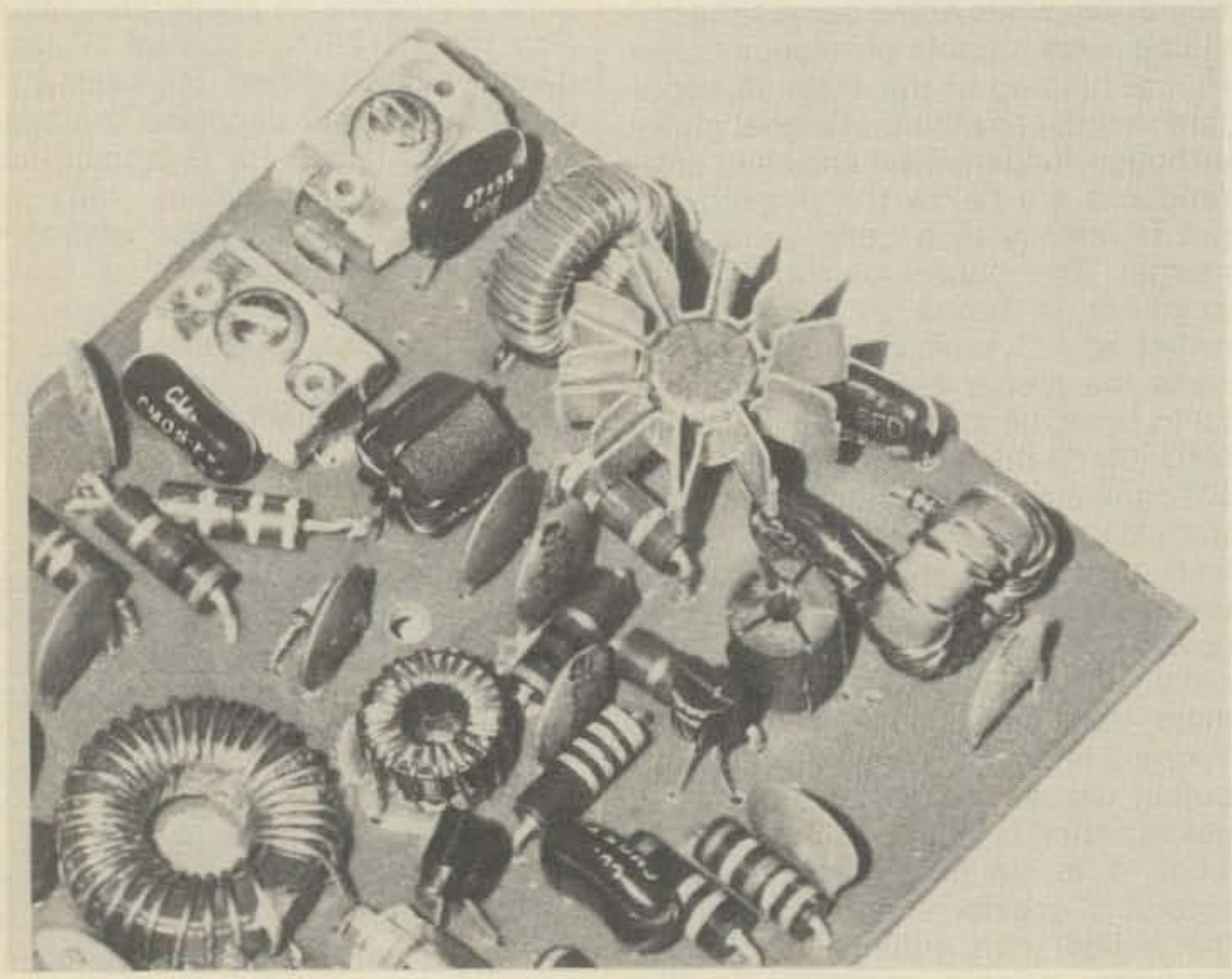
The p.c. board can be prepared by using the method suggested in earlier articles which makes use of self-adhesive address labels. After the p.c. stock is cut to size, the foil is covered with the self-adheisve labels. The p.c. board template is then copied or cut from the magazine, and firmly glued in place to the address label surface. A sharp-tipped knife or razor and straightedge are used to cut away unwanted material in order to expose the copper that is to be etched away. The board is then etched. Finally, the mounting holes are drilled. For more complete details on this approach, see "Easy P.C. Board Fabrication Using Self-Adhesive Address Labels," *CQ*, March, 1978. This method produces a professional board with a minimal amount of effort. Once the board is etched, the adhesive steel-wooled clean, and holes drilled, assembly of the unit can proceed.

Assembly

Assembly can proceed stage by stage, beginning with the oscillator section. Addition of the Varactor tuning circuit can wait until oscillator operation is confirmed. Once the oscillator is wired, apply B+ supply voltage and check the C1 end of L1 for an indication of a.c. voltage by using an r.f. probe. If an indication of voltage is present, the stage is functioning and the Varactor tuning system may then be added. If no r.f. probe/v.t.v.m. is available, operation can be verified by locating the oscillator signal on the station receiver at the high end of 80 meters, or somewhere in the 75 meter band. Once the Varactor tuning circuit is assmebled and the frequency tuning potentiometer connected, preliminary adjustment of v.f.o. frequency can be attempted. Turn the v.f.o. on and locate the signal on the receiver. With R12 adjusted for lowest v.f.o. frequency, adjust C4 to bring the signal down to the bandedge at 3.5 MHz. The turns of L1 may have to be compressed or spread out to complete this preliminary adjustment. Accuracy is not the objective at this point.

Next, the Q2 stage can be assembled followed by the diode frequency doubler stage. R5 determines the gain of the buffer-amplifier Q2 stage, and the value shown should produce peak gain in this stage. However, one transistor tried in the circuit required a 50% lower value of R5 to achieve peak gain. This was the exception though. R.m.s. voltage readings can be checked against those given in fig. 1 to verify proper operation of the circuit. Finally, the Q3 amplifier stage can be assembled. Some means of measuring output is necessary. This may be an r.f. power meter or a v.t.v.m./r.f. probe reading r.f. voltage developed across a 47-52 ohm resistor is temporarily soldered across the output foils. With SW1a-b in the 80 meter position, peak C19 for maximum indication of output, and check the readings against those shown in fig. 1. Switch to the 40 meter position and peak C17 for maximum output. Next, R9 controls the gain of Q3 and the value shown provided maximum output vs waveform purity for several transistors (2N3866) tried in the circuit. If output from the unit is significantly below the reading shown in fig. 1, substitution of other values for R9 may be attempted in order to achieve peak output. If a scope is available, monitor purity of waveform on 40 meters as R9 is varied, and note the setting of C17 which produces purest waveform on 40 meters. There should be very little variation in waveform purity when tuning C17 through peak range. Finally, return to adjustment of the v.f.o. frequency.

Final adjustment of v.f.o. frequency requires setting the oscillator at the low edge of the desired frequency range. With the values given in fig. 1, adjustment of C4 should be adequate to set the frequency at the bandedge. However, if the frequency falls above or below the bandedge, L1 must be readjusted by either spreading the turns of the coil (raise the frequency) or compressing them (lower the frequency.) Next, firmly attach L1, RFC1, RFC2, and RFC3 to the p.c. board by melting parafin wax, or wax from a birthday candle, and flowing it over these toroids and onto the p.c. board. A liberal dosage is recommended in order to insure a firm adherence to the board. This will eliminate mechanical instabilities that could



An enlargement of the upper half of the board showing the buffer-amplifier, doubler, and amplifier sections. Q1 can be seen at the bottom center, with RFC3 at center of the board. Just below the C18-19 silver mica-trimmer capacitor can be seen a pair of resistors which are crossed (R4-R11). The crossing was made necessary by an error in the board layout which is corrected in the template which accompanies this article. A close look at RFC3 will reveal a mottled area where RRC3 meets the p.c. board—this mottled area is the wax that has been melted over RFC3 to fasten it to the board. The parts running SE from C19 are RFC4, C14, C15, and R10, with R9 under the heatsink fins. C12 is at the upper edge beneath the heatsink fin, while RFC-C13-T1-C10 are grouped in the east corner.

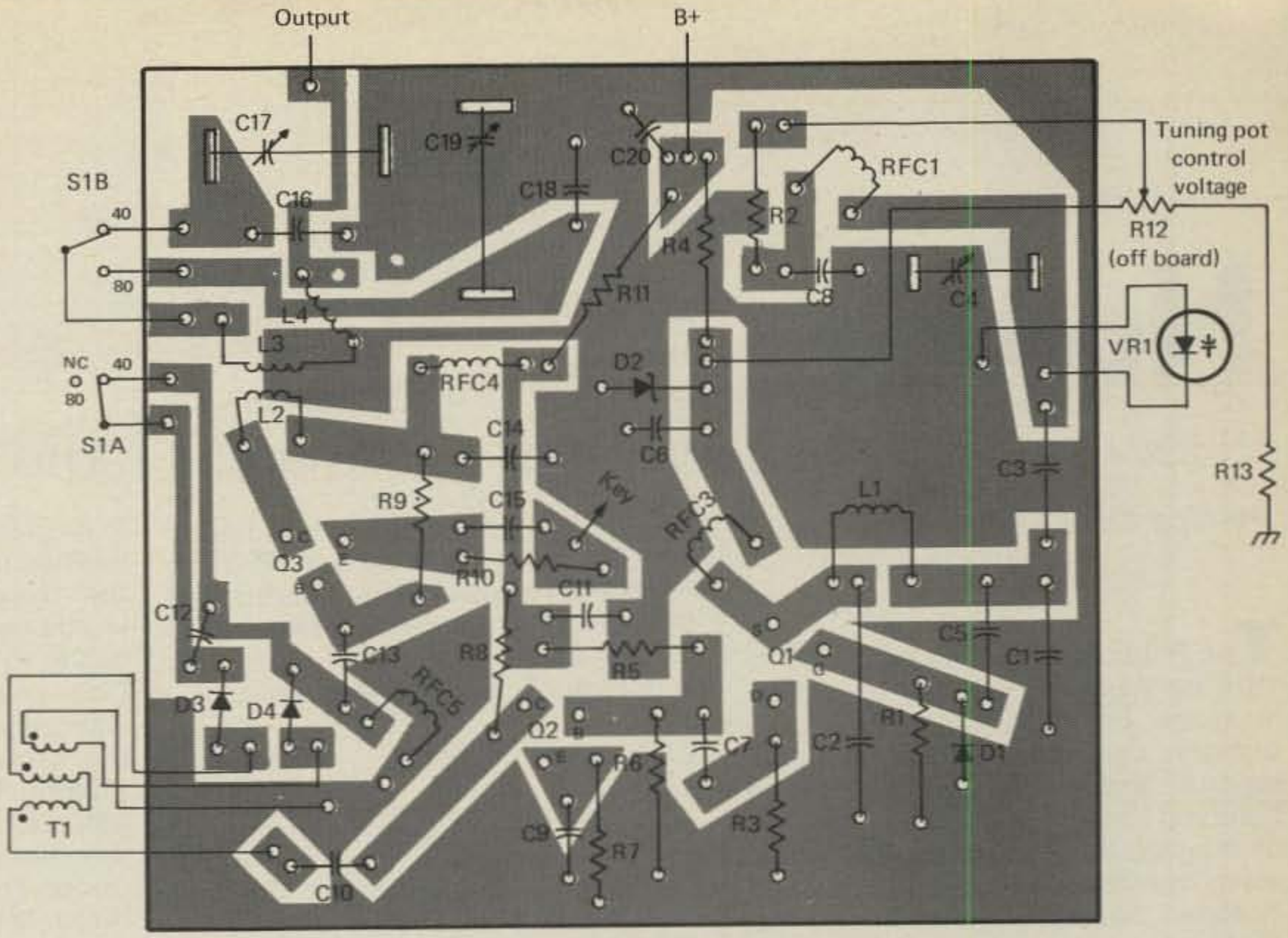


Fig. 3- PC Board shown twice in size with parts layout.

cause frequency jumping. Once the wax is cooled, repeat the final frequency adjustment procedure. Once the frequency is adjusted, tune the v.f.o. to its center frequency by adjusting R12, and repeat the peaking of Q3 on both 40 and 80 meters at that point. Note the output reading at center-frequency, and then move the v.f.o. to high and low bandedges and check the output from Q3 at those points. This will provide a curve indicating the dropoff of output either side of center-frequency. On the units tested, center-frequency readings were 3 V r.m.s. and 2.1 V r.m.s. for 80 and 40 meters respectively, and bandedge readings were 2.2 V r.m.s and 1.7 V r.m.s.

Driving the Viking-5

If the unit is to be used to drive the Viking-5 two-band transmitter, output from the v.f.o. is connected to the crystal socket at the base of the Viking-5 Q1. *The .001 ceramic capacitor between the base and emitter foils of Q1 must be disconnected for v.f.o. operation.* Solder the jumper across the key foils of the v.f.o. Q3 so that the v.f.o. is not keyed, but runs continuously. Connect the key to the proper Viking-5 jack, as well as B+ supply voltage and antenna or dummy load. With both units on 80 meters, key the Viking-5 and adjust the 80 meter Q1 trimmer for maximum output from the transmitter at v.f.o. center-frequency. Repeat the process on 40 meters. Output from the Viking-5 will show some dropoff at the bandedges, as noted for the v.f.o. Stagger-tuning the v.f.o. Q3 output trimmer and the Viking-5 Q1 trimmer, (i.e., peak v.f.o. output at 30% above lower bandedge, and peak Viking-5 Q1 trimmer at 30% below higher bandedge), will produce a more uniform output across the entire frequency spread. If the frequency spread is wider than desired, the value of R13 may be increased to compress the spread available, or decreased to increase the spread. Some readjustment of C4 will be necessary in this case. Keying of the Viking-5 should produce no noticeable shift in v.f.o. freqeuncy. Once all adjustments are completed, the unit is ready to go on the air in search of DX!!!

If the builder desires a miniature, portable unit, the v.f.o. and Viking-5 may be mounted in a Calectro #139 box (5.5″ × 3″ × 1.25″). This will require redesigning the Viking-5 p. c. board to the proper dimensions to permit a fit. A subminiature potentiometer should be used at R12 in this case to permit a proper fit on the front panel.

Ultimately, whether you go the miniature route, or house the combo in a larger enclosure, it will provide a solid, healthy signal which will yield many enjoyable QSO's on both 80 and 40 meters when used with a decent antenna, such as an inverted Vee, a dipole, or a trap vertical with a good ground plane.

An angle shot providing a somewhat clearer view of the layout from this angle.

a monthly feature by

BILL WELSH, W6DDB

Novice

"How to" for the newcomer to Amateur radio

Phillips Code - 100 Years Young Part I of II

The Phillips Code was produced in 1879 by Walter P. Phillips to reduce message handling time. Its initial primary use was in handling press reports, where it reduced message handling time by one-third to one-half of what would be required if all words were spelled out. Phillips Code became so well known that correspondents often filed stories with the words already converted to the Phillips Code Similarly, receiving operators normally converted Phillips Code abbreviations to their original full spellings as they typed messages being received. Prior to the formal introduction of the Phillips Code, radio and wire telegraph operators commonly devised their own telegraph shorthand systems. However, various operators had different meanings for the same abbreviations and this caused confusion and errors. The published Phillips Code provided standard meanings which were accepted and used by operators. The Vibroplex Company has made a printed Phillips Code book available for many years and they apparently still sell it.

If you gain access to an official list of Phillips Code signals, you will quickly see that amateur radio operators do not use the real Phillips Code. Amateurs use a phonetic telegraph abbreviation system that usually differs from the real Phillips Code, but which is much easier to learn. Amateurs use letter combinations that usually sound like the word they represent if one tries to pronounce the remaining letters. As a simple example, "How are you?" is sent "HW R U?". The actual Phillips Code used an absolute minimum of letters and required operators to memorize what amounts to a new language. The phonetic telegraph shorthand used by amateurs is easily understood by even the rawest newcomer and it suits our needs better than the strict and sparse Phillips Code. The following examples show a few typical differences between real Phillips Code abbreviations and the ones typically used by amateurs:

Word	Phillips	Amateur
About	AB	ABT
Accept	ACP	ACPT
Aircraft	ACF	ACFT
Answer	AR	ANSR
Any	AY	ANI

This is Pam Stoneback (KA4EWG) of Arlington, Virginia. Pam has worked 30 states and Canada with her Kenwood 599 Twins, Heath HW-101, and a combination of Hustler mobile whips as antennas. She is an RCC member and frequently serves as net control of the Arlington Amateur Radio Club's 10 meter code net. Pam has an ARRL 10 wpm code proficiency certificate. She says her husband urged her to become an amateur for 10 years before she decided to take the plunge. Pam upgraded to General right after these photographs were taken. Listen for Pam and her OM on the air.

A glance at the preceding comparitive abbreviations should confirm that the average telegraph shorthand words used by amateurs is longer but easier to recognize than their Phillips Code counterparts. Some of the abbreviations amateurs use are precisely the same as have been used in the Phillips Code for 100 years. As examples, again, among, amount, and are sent as AGN, AMG, AMT, AND R under both systems. A glance through the list of abbreviations in this issue also reveals that common abbreviations such as LB (pound) and PKG (package) are used because they are known by most amateurs.

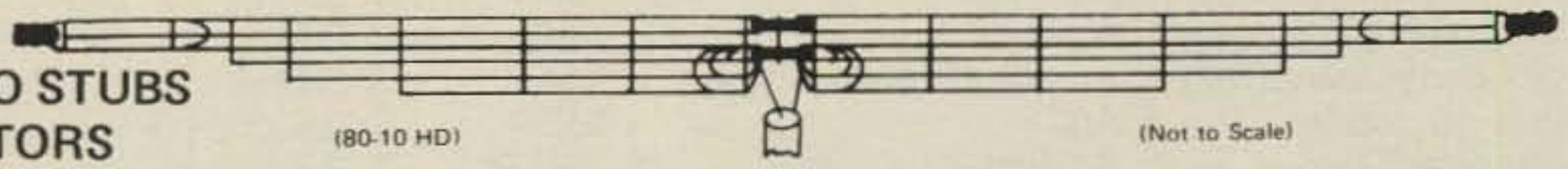
Amateurs shorten sending time by using a variety of shortcuts that are not usually part of the actual Phillips Code. As an example, we commonly use the letter T to represent the number zero in any case where numbers are obviously intended. Instead of saying the rig runs 100 watts, for example, we usually say it runs 1TT W. It is faster and easier to send the letter T (-) than the zero (-----) and no meaning is lost. Similarly, the W obviously means watts in this instance. The letter I (..) is shorter and easier to send than the letter Y (-.--), so we use I in lieu of Y in many cases. I do not know of a published complete listing of phonetic telegraph abbreviations used by amateurs. However, this article contains a fairly complete listing that has been taken from one of my licensing class aids. As you will quickly see, I have not tried to include every possible variation of each word since such variations are easily determined from the basic abbreviation. Words such as answer, answered, and answering would be ANSR, ANSRD, and ANSRG, respectively; however, just the word answer is shown in this listing. Obviously, there is no objection to using any abbreviation one makes up, as long as the correct meaning is readily apparent. On the other hand, it is a poor communication practice to use any phonetic telegraph abbreviation that is likely to be unknown or misunderstood by the other operator. The use of such shortcuts should be mini-

2814 Empire Ave., Burbank, CA 91504

A VERY IMPORTANT ANNOUNCEMENT FROM MOR-GAIN

WORLD'S LARGEST SPECIALISTS IN THE DESIGNING, DEVELOPING AND MANUFACTURING OF "NO COIL, NO TRAP" ANTENNA SYSTEMS.

NO TRAPS,
NO COILS, NO STUBS
NO CAPACITORS



multi-band multi-frequency HF communications antennas
one half the length of conventional antennas
high performance and maximum efficiency
lowest cost/highest performance antenna available
fully assembled and pre-tuned ready for installation

★ ★ ★ NEW ★ ★ ★

Available Only from MOR-GAIN Two Models Specifically Designed for the Novice/Technician Operator. All of the Features and Performance of the Regular MOR-GAIN HD Dipoles but Optimized for the Operating Requirements of the Novice/Technician Licensee. See Below for Specifications and Prices.

• There is no better antenna at any price . . . W9QIO • I had a Mor-Gain antenna and liked it extremely well . . . K4JMR • The antenna has worked out well with very good reports . . . W2TVK • I can only give glowing reports about it . . . WA2IRN • I have used these fine antennas before and see no reason to change now . . . W6BF • It has given me excellent service and results . . . W6CZS • I believe I have "sold" your antenna to almost every ham I have talked to . . . W4AHN • Its performance here far surpasses any other antenna that I have had . . . WA5GGS • For several years I have used the Mor-Gain and have been very satisfied . . . K2TSD • Am letting everybody know that it has been doing a good job for me . . . VE2VW • The antenna is performing just beautifully . . . W8WDZ/6 • My 75-40 has performed beautifully and I'm very happy with it . . . WB8DMB • Another chap said he had also used it and that it was the greatest . . . W4NSP • I do not hesitate to recommend the antennas to others . . . K0SPR • I heard a ham extolling the virtues of your antenna . . . WB0PTM • I worked a station last night and the Mor-Gain was doing quite a job for him . . . WA3TCV

MOR-GAIN HD DIPOLES . . . • One half the length of conventional half-wave dipoles. • Multi-band, Multi-frequency • Maximum efficiency - no traps, loading coils, or stubs. Fully assembled and pre-tuned - no measuring. no cutting. • All weather rated - 1 KW AM, 2.5 KW CW or PEP SSB. • Proven performance - more than 15,000 have been delivered. • Permits use of the full capabilities of today's 5-band xcvrs. • One feedline for operation on all bands. • Lowest cost/benefit antenna on the market today. • Fast QSY - no feedline switching. • Highest performance for the Novice as well as the extra-class op.

• ST and HD models are furnished with crimp/solder lugs for transmission line connection. • HD/A models are furnished with female coax connector which mates with standard PL-259 male cable connector. • Designed for low height installation: 20-40 feet. • 50 ohm feed point impedance on all bands. • 75-(**) models are factory tuned for resonance at 3950 kHz; 75- (xx) HD (S/P) models - 3800 kHz., 80-(xx) models - 3650 kHz.

EXCLUSIVE 66 FOOT, 75-10 METER DIPOLES

• May be installed as inverted vee with negligable effect on performance. • Fabricated from high-strength 40% copperweld wire - over 500 pound breaking strength. • Stainless steel hardware. • Completely assembled and pre-tuned. No cutting or measuring necessary. • 1-year limited warranty. • Patented linear phase loading principle eliminates need for traps, loading coils or stubs. • Engineering design and manufacturing is backed by our more than 15 years experience. • Professional grade design - Amateur models are identical to those we produce for commercial/industrial systems • No antenna tuner required for operation within stated specifications. • Re-tuneable by the user to accomodate site proximity effects.

MODEL	BAND (Meters)	LENGTH (feet)	PRICE
40-20-HD	40/20	36	$58.25
40-20 HD/A	40/20	36	$63.50
75-10 HD	75/40/20/15/10	66	$94.25
75-10 HD/A	75/40/20/15/10	66	$99.50
75-10 HD(SP)	75/40/20/15/10	66	$94.25
75-10 HD(SP)A	75/40/20/15/10	66	$99.50
75-20 HD	75/40/20	66	$80.25
75-20 HD/A	75/40/20	66	$85.50
75-20 HD(SP)	75/40/20	66	$80.25
75-20 HD(SP)A	75/40/20	66	$85.50
75-40 HD	75/40	66	$68.00
75-40 HD/A	75/40	66	$73.25
75-40 HD(SP)	75/40	66	$68.00
75-40 HD(SP)A	75/40	66	$73.25
80-10 HD	80/40/20/15/10	69	$98.50
80-10 HD/A	80/40/20/15/10	69	$103.75
80-10 HD(NT)	80/40/20/15/10	69	$98.50
80-10 HD(NT)A	80/40/20/15/10	69	$103.75
80-40 HD	80/40/15	69	$72.00
80-40 HD/A	80/40/15	69	$77.25
80-40 HD(NT)	80/40/15	69	$72.00
80-40 HD(NT)A	80/40/15	69	$77.25

Please include $2.75 for shipping and insurance.

NOVICE LICENSE OPERATION. The MOR-GAIN HD Dipole is the ideal antenna for the new or Novice operator. As the Novice progresses to higher license classes, he can easily re-tune the HD Dipole to the new frequencies of his higher frequency privileges. The HD Dipole is thus a one-time investment. HD Dipoles are available for all Novice frequencies.

LEAST COST. Dollar for dollar, the HD dipoles are the highest performance, least cost multi-band antennas on the market today. For example: the 5-band 75-10 HD dipole costs less than $20.00 per band - an unbeatable low cost.

LIMITED REAL ESTATE. Where real estate for antenna installation is limited, the HD dipole is the ideal solution. Operation on 80/75/40 meters is now possible since the HD dipole is only half the length of a conventional half-wave dipole. For all around operation, the HD dipole will outperform any trap loaded horizontal or vertical dipole.

Mor-Gain
2200 C South 4th Street
Leavenworth, Kansas 66048
(913) 682-3142
Monday-Friday: 9 AM-5PM CST

MOR-GAIN

BankAmericard, Visa, and Mastercharge are available.

Please write for fully descriptive 5 page brochure. Contact your favorite dealer or order direct from Mor-Gain.

CIRCLE 44 ON READER SERVICE CARD

mized or avoided when one is in contact with a beginning amateur because they have enough trouble copying and understanding what is sent to them when all the words are spelled out and clearly separated from each other. Do not require or expect a new amateur to know telegraph shortcuts; give them time to slowly learn this unique code within a code. The following list shows each word (or phrase) with its typical matching phonetic telegraph abbreviation. If enough good suggested additional abbreviations are submitted in writing, a more complete listing may be issued. This month's list is in word (sending) sequence and next month's conclusion to this article will provide an equivalent list arranged in abbreviation (receiving) sequence.

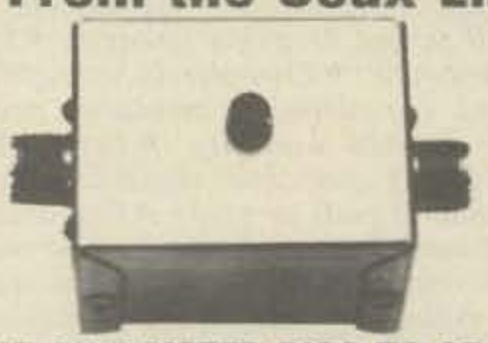
Abbreviation	ABVTN
Able	ABL
About	ABT
Accept	ACPT
Accessory	ACCY
Account	ACNT
Achieve	ACHV
Address	ADR
Advance	ADVNC
Advise	ADVZ
Africa	AFR
Afternoon	AFTRNN
Again	AGN
Against	AGNST
Agreed	AGRD
Ahead	AHD
Aircraft	ACFT
All After	AA
All Before	AB
Along	ALNG
Among	AMG
Amount	AMT
Amplitude Modulation	AM
And	ES
Answer	ANSR
Antenna	ANT
Any	ANI
April	APR
Appreciate	APP
Are	R
Around	ARND
As Soon As Possible	ASAP
Attention	KA
August	AUG
Avenue	AVE
Average	AVG
Backward	BKWD
Bad	BD
Battery	BTRI
Be	B
Beacon	BCN
Beat Frequency Oscillator	BFO
Become	BCUM
Been	BN
Before	B4
Begin	BGN
Believe	BLV
Beneath	BNTH
Benefit	BNFT
Be Seeing You	BCNU
Best	BST
Best Regards	73
Better	BTR
Black	BLK
Blow	BLO
Blue	BLU
Book	BUK
Both	BTH
Bother	BTHR
Bought	BOT
Boulevard	BLVD
Bound	BND
Break	BT
Breakfast	BKFST
Breeze	BRZ
Brief	BRF
Brilliant	BRLNT
Bring	BRNG
Broadcast	BDCST
Broadcast Listener	BCL
Broken	BRKN
Brother	BRTHR
Brought	BROT
Building	BLDG
Built	BLT
Bureau	BURO
Burn	BRN
Business	BIZ
Cable	CBL
Called	CLD
Calling	CLG
Callsign	CS
Captain	CPTN
Careful	CRFL
Cause	CUZ
Celsius	C

CoaxProbe*

Coaxial RF Probe for Frequency Counters and Oscilloscopes That Lets You Monitor Your Transmitted Signal Directly From the Coax Line.

Only **$6.95**

Kit $9.95 Assembled
plus 1.00 postage



FINALLY! A RF PROBE that lets you connect into your coax cable for frequency measurements and modulation waveform checks directly from the transmitter.

JUST CONNECT THE CoaxProbe* into your transmission line and plug the output into the frequency counter or oscilloscope. Insertion loss is less than .2db so you can leave it in while you operate.

A NECESSITY IN ANY WELL-ORGANIZED HAM SHACK, the CoaxProbe* eliminates "jerry-rigging" and hassles when tapping into the coax line is desired.

A SPECIAL METHOD OF SAMPLING keeps output relatively constant with a wide variation of power. Power output of 8 watts gives .31v out, while 800 watts will give 1.8v out. (rms 3-30 mhz.) 2000 watts PEP rating too!

*Trademark of Eagle Electronics.

USE IT ON 2 METER RIGS TO ADJUST FREQUENCY. The CoaxProbe* has a range of 1.8 to 150 mhz.

MONITOR YOUR MODULATION WAVEFORM. With an oscilloscope of proper bandwidth, you can check your modulation for flat-topping, etc. Ideal for adjusting the speech processor.

NOW YOU CAN MONITOR SIGNALS when connected to the dummy load, eliminating unnecessary on-the-air radiation.

AVAILABLE FOR THE FIRST TIME TO AMATEURS. Try it for 10 days. If not satisfied, send it back for refund (minus shipping charges).

Order today from:

Eagle Electronics

Box 426 A, Portage, MI 49081
Michigan Res. Add 4% Sales Tax

CIRCLE 14 ON READER SERVICE CARD

ALL NEW 1979 EDITION

THIRD BIG EDITION! The most complete directory of Amateur Radio Equipment — over 1600 products — over 100 manufacturers/distributors. Includes prices, specifications and pictures of transceivers, transmitters, receivers, amplifiers, power supplies, transverters, antennas, tuners, towers, meters, microphones, keyers, VFO's, pre-amps, test gear, etc. etc.

BONUS — Included with each directory is a free newsletter containing the latest price and product information. No ham library is complete without a copy of the 1979 Edition!

Order your copy today! Only $4.50 postpaid (U.S.), $6.00 First Class Mail (U.S.) — Canada $5.50 — Foreign (air) $8.00.

KENGORE CORP. Dept. Q

9 James Ave. Kendall Pk., NJ 08824

Special offer — a complete set of 77, 78 and 79 Directories is available for $9.00 (U.S. only).

CIRCLE 24 ON READER SERVICE CARD

Centigrade	C
Certainly	CRTNLI
Chairman	CHMN
Chance	CHNC
Change	CHNG
Charge	CHRG
Check	CK
Chief	CHF
Choose	CHUZ
Circle	CRCL
Circuit	CKT
Circuit Breaker	CB
Civil	CVL
Civil Defense	CD
Clear	CLR
Cloudy	CLDI
Closing	CL
Clicks	KLIX
Coaxial Cable	COAX
Collect	CLCT
Collector	CLCTR
Collide	CLIDE
Come	CUM
Comfort	CMFT
Coming	CMG
Commercial	CMCL
Common	CMN
Communication	COMM
Compare	CMPR
Compete	CMPT
Complete	CMPLT
Compose	CMPZ
Computer	CMPTR
Concentrate	CNCNTRT
Concern	CNCRN
Concur	CNCR
Conditions	CONDX
Conduct	CNDCT
Confer	CNFR
Confine	CNFN
Confirm	CONFM
Conform	CNFOM
Congratulations	CNGRTS
Conserve	CNSRV
Consider	CNSDR
Constitutional	CNSTTNL
Construct	CNSTRCT
Consult	CNSLT
Contact	CNTCT or QSO
Contain	CNTN
Contest	CNTST
Continue	CNTNU
Continuous Wave (AØ)	CW
Contribute	CNTRBT
Control	CNTRL
Convention	CNVNTN
Converse	CNVRS
Convert	CNVRT
Convince	CNVNC
Cook	CUK
Copi	CPI
Correct	CRCT
Could	CUD
Count	CNT
Couple	CPL
Cover	CVR
Credit	CRDT
Cruise	CRUZ
Crystal	XTAL
Custom	CSTM
Daughter	DGTR
Day	DA
Dealer	DLR
December	DEC
Decide	DCD
Declare	DCLR
Decrease	DCRS
Delay	DLY
Deliver	DLVR
Demand	DMND
Depart	DPRT
Derive	DRV
Describe	DSCRB
Deserve	DSRV
Desire	DSR
Develop	DVLP
Device	DVC
Differ	DFR
Difference	DFRNC
Difficult	DFCLT
Dinner	DNR
Direction	DRCTN
Discharge	DSCHG
Distant Station	DX
Divide	DVD
Document	DCMNT
Does	DUZ
Does Not	DSNT
Dollar	DLR
Do Not Know	DUNNO
Double	DBL
Doubt	DBT
Down	DWN
Duplicate	DPLCT
During	DRG
Each	ECH
Eager	EGR
East	E
Effect	EFCT
Effort	EFRT
Element	EL
Emergency	EMGNCY
Emitter	EMTR
Employed	EMPLD
Empty	MT
Encourage	ENCRG
Endeavor	ENDVR
End of Message	AR
End of Work	SK
Engineer	ENGR
Enough	ENUF
Entering	NTRNG
Equal	EQL
Equip	EQP
Equipment	EQPMT
Equivalent	EQVLNT
Essential	ESNTL
Establish	STBLSH
Estimated	ESTMTD
Estimated Time of Arrival	ETA
Estimated Time of Departure	ETD
Etcetera	ETC
Europe	EU
Even	EVN
Evening	EVE
Ever	EVR
Evident	EVDNT
Exact	XCT
Exactly	XCTLI
Exceed	XCD
Excel	XCL
Except	XCPT
Exchange	XCHNG
Exciter	XCTR
Exciting	XCTG
Exclude	XCLUDE
Exclusive	XCLSV
Exempt	XMPT
Exercise	XRCISE
Exert	XRT
Exhibit	XHBT
Exists	XSTS
Expedite	XPDT
Expedition	XPDTN
Expend	XPND
Expenditure	XPNDTR
Expense	XPNS
Expensive	XPNSV
Experience	XPRNC
Experiment	XPRMNT
Expert	XPERT
Explain	XPLN
Explode	XPLODE
Export	XPORT
Expose	XPOZ
Extend	XTND
Extent	XTNT
Extensive	XTNSV
External	XTRNL
Extinguish	XTNGSH
Extra	XTRA
Extreme	XTRM
Fabulous	FABLUS
Fact	FCT
Faction	FCTN
Factor	FCTR
Facts	FAX
Fahrenheit	F
Failed	FLD
Favor	FVR
Favorable	FVRBL
Feature	FETR
February	FEB
Federal	FDRL
Federal Communications Commission	FCC
Feel	FL
Feeling	FELG
Few	FU
Field	FLD
Field Day (Contest)	FD
Figure	FIGR
Fine Business	FB
Fired	FRD
First	FRST
Fiscal	FSCL
Fixed	FXD
Fling	FLNG
Floor	FLR
Flow	FLO
Follow	FOLO
Fondest Regards (between females)	33
For	FER or 4
Force	FRC
Forever	FRVR
Formed	FRMD
Forward	FWD
Found	FND
Fraction Follows	AU
Freeze	FRZ
Frequency	FREQ
Frequency Modulation	FM

NO-5-9-60

Frequent	FQNT
Friday	FRI
Friend	FRND
From	DE
Front	FRNT
Fully	FLI
Fundamental	FNDMNTL
Funny	FUNI
Future	FUTR
Gallon	GAL
General	GNRL
General Call To All Stations	CQ
Girl	GRL
Give	GV
Glad	GLD
Glance	GLNC
Gleam	GLM
Going	GG
Gone	GN
Good	GUD
Good Afternoon	GA
Good Evening	GE
Good Luck	GUD LUK
Good Morning	GM
Good Night	GN
Governor	GVNR
Great	GRT
Greenwich Mean Time	GMT
Greetings	GRTNGS
Grief	GRF
Ground	GND
Ground Plane	GP
Group	GRP
Grow	GRO
Guaranteed	GRNTD
Guess	GESS
Had	HD
Half	HAF
Happen	HPN
Happy	HAPI
Have	HV
Having	HVG
Head	HED
Heading	HDG
Headquarters	HQ
Health	HLTH
Heard	HRD
Heavy	HVI
Here	HR
High	HI
Highway	HWY
Holds	HLDS
Hook	HUK
Hope	HPE
Hotel	HTL
Hours	HRS
How	HW
How Do You Copy	HW?
Hurry	HRI
Identification	ID
Identify	IDNTFI
Ignorant	IGNRNT
Illustrate	ILSTRT
Imagine	IMGN
Immediate	IMDT
Important	IMPTNT
Improve	IMPRV
In Accordance With	IAW
Include	INCLD
Income	INCM
Increase	INCRS
Indicate	INDCT
Individual	INDVDL
Information	INFO
Injure	INJR
Input	INPT
Inquire	INQR
Inspect	INSPCT
Instant	INSTNT
Intend	INTND
Interest	INTRST
Interfere	INTRFR
Interior	INTRR
International Amateur Radio Union	IARU
International Telecommunications Union	ITU
Interrupt	INTRPT
Interview	INTRVW
Introduce	INTRDC
Investigation	INVSTGTN
Involve	INVLV
Issue	ISU
January	JAN
Joined	JND
Joint	JNT
Journey	JRNY
Judge	JDG
July	JUL
June	Jun
Junior	JR
Just	JST
Justify	JSTFI
Keep	KP
Keep Out	99
Kilometers Per Hour	KMPH
Kilowatt	KW
Kind	KND
Know	KNO
Labor	LBR
Landline (Telephone)	LL
Lane	LN
Large	LRG
Latitude	LAT
Laugh	LAF
Laughter	HI
Leader	LDR
Leading	LEDNG
Learn	LRN
Leave	LV
Leaving	LVG
Left	LFT
Letter	LTR
Liable	LIBL
License	LIC
Likely	LKLY
Limit	LMT
Listen	LSN
Liter	LITR
Little	LTL
Loading	LODNG
Location	LCTN
Longer	LNGR
Longitude	LONG
Long Path	LP
Longwire Antenna	LW
Look	LUK
Lossey	LOSSI
Love	LUV
Love and Kisses	88
Low	LO
Lower	LWR
Machinery	MCHNRY
Maintain	MNTN
Make	MK
Making	MKG
Manage	MNG
Manager	MGR
Manner	MNR
Manual	MNL
Manufacture	MFR
Many	MANI
March	MAR
Mark	MK
Market	MKT
Married Female	XYL
Material	MTL
Maximum	MAX
Meaning	MNG
Measure	MSR
Mechanic	MECH
Medium	MED
Meeting	MTG
Member	MBR
Memorandum	MEMO
Merchandise	MRCHNDZ
Message	MSG
Meters	M
Middle	MID
Might	MITE
Miles Per Hour	MPH
Minimum	MIN
Missed	MSD
Mission	MSN
Mister	MR
Moderate	MODRT
Modification	MOD
Modify	MDFI
Moment	MOM
Monday	MON
Morning	MRNG
Mountain	MTN
Moved	MVD
Much	MCH
My	MI
Natural	NATRL
Near	NR
Need	ND
Neutral	NUTRL
Never	NVR
New	NU
No	N
No Good	NG
Nook	NUK
Normal	NORM
North	N
Nothing	NIL
Notified	NTFD
November	NOV
Novice Roundup (Contest)	NR
Now	NW
Number	NMBR
Obtain	OBTN
Occasion	OCSN
Occur	OCR
October	OCT
Offer	OFR
Office	OFC
Official	OFCL
Officially	OFCLI
Often	OFN
Old Man	OM
Old Timer	OT

Omission	OMSN
Omitted	OMTD
Only	ONLI
Operate	OPRT
Operation	OPRTN
Operator	OPR
Opportunity	OPTNTI
Oppose	OPOZ
Option	OPTN
Ordered	ORDRD
Ordinary	ORDNRY
Organization	ORGNZN
Organize	ORGNZ
Original	ORGNL
Ounce	OZ
Over	OVR
Owed	OWD
Package	PKG
Paid	PD
Part	PRT
Participate	PTCPT
Particular	PTCLR
Party	PRTI
Passage	PSG
Passed	PASD
Passenger	PSNGR
Payment	PAMNT
Pending	PAMNT
People	PEPL
Perceive	PRCV
Perfect	PFCT
Perform	PFRM
Perhaps	PHPS
Period	PD or R
Permission	PMSN
Persistent	PSTNT
Photograph	FOTO
Pieces	PCS
Platform	PLTFM
Pleasant	PLSNT
Please	PSE
Pleasure	PLSR
Poor Operator	LID
Popular	PPLR
Portable	PTBL
Position	PSTN
Possible	PSBL
Postpone	PSTPN
Post Office	PO
Post Office Box	POB
Pound	LB
Power	PWR
Power Amplifier	PA
Practical	PCTCL
Practically	PCTCLI
Precipitation	PCPTN
Prefer	PFR
Preliminary	PRLMNRI
Prepare	PRPR
Present	PRSNT
Presented	PRSNTD
Presently	PRSNTLI
President	PRES
Press Report	PX
Pressure	PRSR
Previal	PRVL
Prevent	PRVNT
Principal	PRNCPL
Printed Circuit	PC
Printed Circuit Board	PCB
Private	PVT
Privilege	PRVLG
Prize	PRZ
Probably	PRBLI
Procedure	PRCDR
Proceed	PRCD
Produce	PRDC
Product	PRDCT
Production	PRDCTN
Professional	PRO
Program	PRGRM
Progress	PRGRS
Prohibit	PRHBT
Propagation	PRPGTN
Property	PRPTI
Proposition	PRPSTN
Protect	PRTCT
Provide	PRVD
Provision	PRVSN
Publication	PBLCN
Published	PBLSHD
Publicity	PBLCTI
Purchase	PRCHS
Qualify	QLFI
Quality	QLTI
Quantity	QTI
Quarrel	QRL
Quarter	QRTR
Question	QSTN
Quick	QCK
Quite	QT
Radical	RADCL
Rag Chewers Club	RCC
Railroad	RR
Railway	RLWY
Raised	RSD
Rather	RTHR
Reach	RCH
Ready	RDI
Realize	RLZ
Really	REALI
Reasonable	RSNBL
Receive	RCV
Received	RCVD
Received Okay	R
Receiver	RCVR
Receiving	RCVG
Recognize	RCGNZ
Recommend	RCMND
Record	RCRD
Recover	RCOVR
Recruit	RCRT
Reduce	RDC
Refer	RFR
Reflect	RFLCT
Reform	RFRM
Refuse	RFZ
Regard	RGRD
Register	RGSTR
Regular	RGLR
Regulation	RGLTN
Reject	RJCT
Relate	RLT
Related	RLTD
Relation	RLTN
Relief	RLF
Relieve	RLV
Rely	RELI
Remain	RMN
Remark	RMRK
Remember	RMBR
Remove	RMV
Renew	RENU
Repair	RPR
Repeat	RPT
Reply	REPLI
Report	RPRT
Represent	RPRSNT
Request	RQST
Require	RQR
Reserve	RSRV
Residence	RSDNC
Resistance	RSTNC
Resolve	RSLV
Respect	RSPCT
Return	RTRN
Review	RVW
Revolve	RVLV
Reward	RWRD
Ridicule	RIDCL
Right	RITE
River	RVR
Road	RD
Robbed	RBD
Rooked	RUKD
Room	RM
Rotor	RTR
Rough	RUF
Rumor	RMR
Running	RNG
Said	SED
Salary	SLRI
Satisfactory	STSFCTRI
Saturday	SAT
Says	SEZ
Scarce	SCRC
Schedule	SKED
Season	SSN
Seclude	SCLD
Second	SEC
Secretary	SCTRI
Section	SCTN
See	C
Seem	SM
Seen	SN
See You Later	CUL
Seize	SZ
Seizure	SZR
Self Addressed Stamped Envelope	SASE
Senior	SR
Sentence	SNTNC
September	SEPT
Servant	SRVNT
Served	SRVD
Service	SVC
Several	SVRL
Severe	SVR
Shall	SHL
Shake	SHK
Shipped	SHPD
Shipment	SHPMNT
Shook	SHUK
Short Path	SP
Should	SHUD
Signals	SIGS
Signature	SIG
Significant	SGNFCNT
Signify	SGNFI
Silver	SLVR
Similar	SMLR
Single Sideband	SSB
Sister	SIS
Situation	SITN
Small	SML
Society	SCTI

Some	SUM	Telephone	FONE	Transmit	XMT
Soon	SN	Temperature	TEMP	Transmitter	XMTR
Sorry	SRI	Terrific	TRFC	Transmission	XMSN
South	S	Testify	TSTFI	Transmitting	XMTG
South America	SA	Text	TXT	Trouble	TRBL
Spare	SPR	Thanks	TNX	Tuesday	TUE
Special	SPCL	Thank You	TU	Unacceptable	UNACPTBL
Specify	SPCFI	That	DAT or TT	Unauthorized	UNAUTHRZD
Spoken	SPKN	The	DE	Unavoidable	UNAVDBL
Sport	SPRT	Them	DEM	Unchanged	UNCHNGD
Standard	STD	Then	DEN	Uncommon	UNCMN
Station	STN	There	DERE	Undelivered	UNDLVRD
Statement	STTMNT	These	DESE	Understand	UNDRSTND
Statistic	STAT	They	DEY	Understood	SN
Steady	STEDI	Thing	TNG	Unexpected	UNXPCTD
Steamship	SS	This	DIS	Unfavorable	UNFVRBL
Stowed	STWD	Those	DOSE	Unfortunate	UNFRTNT
Street	ST	Through	THRU	Unfortunately	UNFRTNTLI
Study	STUDI	Thursday	THUR	Unfounded	UNFNDD
Submit	SBMT	Time Tick	TX	Unguarded	UNGRDD
Subsequence	SBSQNC	To	2	Unheard	UNHRD
Subsequent	SBSQNT	Today	TDY	Unidentified	UNIDNTFD
Substantial	SBSTNTL	Tomorrow	TMRW	Uniform	UNFRM
Such	SCH	Tonight	TNITE	Unimportant	UNIMPTNT
Sudden	SDN	Took	TUK	United	UNTD
Sufficient	SFCNT	Total	TTL	Universal	UNVRSL
Suggest	SGST	Touch	TCH	Universal Time Coordinated	UTC
Suitable	STBL	Tough	TUF	Unknown	UNON
Sunday	SUN	Toward	TWRD	Unmarried Female	YL
Surround	SRND	Towed	TWD	Unnecessary	UNCSRI
Swear	SWR	Traffic	TFC	Unsatisfactory	UNSTSFCTRI
Sweepstakes (Contest)	SS	Train	TRN	Until	TIL
Switch	SW	Transceiver	XCVR	Upper	UPR
Take	TK	Transfer	XFR	Upward	UPWD
Technician	TECH	Transform	XFRM		

Ten-Tec OMNI

NEW!
Series "B"
OMNI

THE COMM CENTER INC

CALL TOLL FREE
1-800-638-4486
For Details

Laurel Plaza - Rte 198, Laurel, MD 20810

CIRCLE 9 ON READER SERVICE CARD

Call or Write for Delivery or Quote

ICOM IC701
with AC/MIC

LEAVE A MESSAGE & WE'LL CALL YOU BACK!

W5GJ. W5MBB. K5AAD. N5JJ. AG5K. W5VVM. W5EGP. WA5TGU. WB5AYF. K5BGB.

MASTERCHARGE • VISA

MADISON
ELECTRONICS SUPPLY, INC.
1508 McKINNEY • HOUSTON, TEXAS 77002
713/658-0268

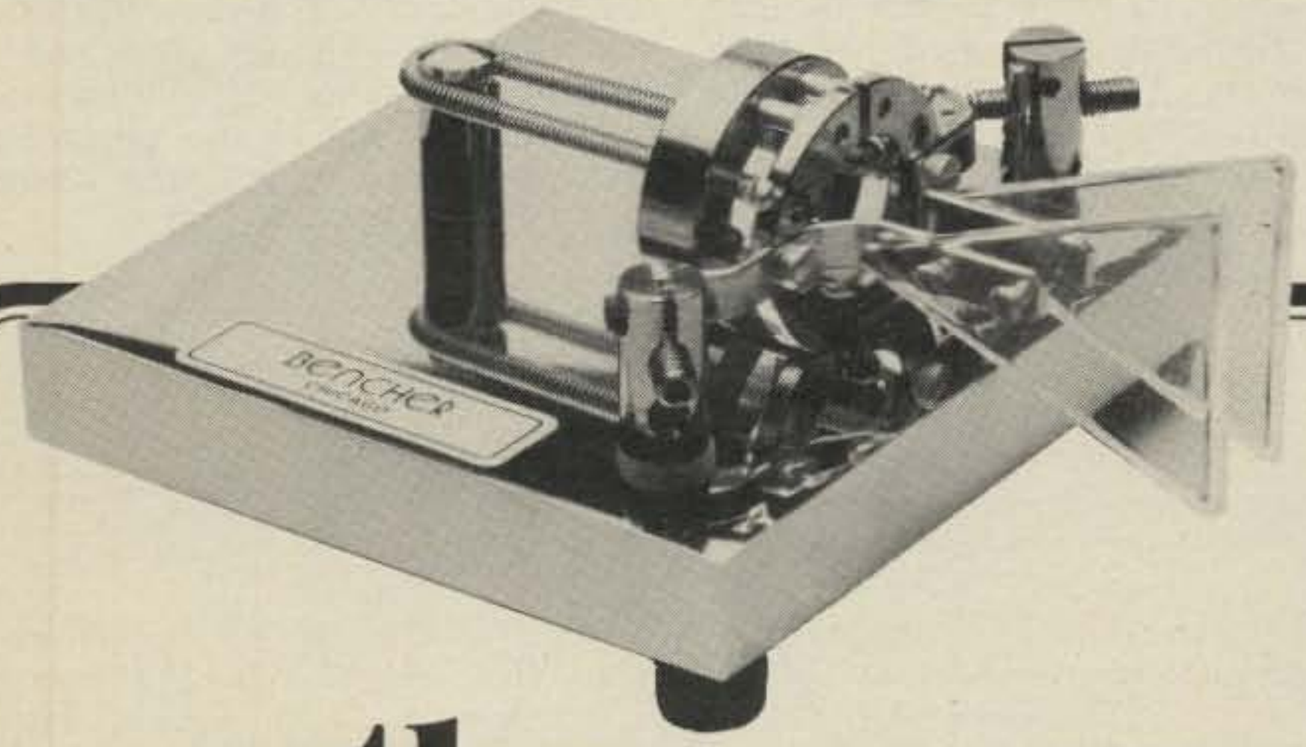
DLA!

CIRCLE 26 ON READER SERVICE CARD

Urgently	URGNTLI	Voyage	VYG	Yes	C
Usually	USLI	Vulgar	VLGR	Yesterday	YSTDY
Utter	UTR	Wagon	WGN	Yield	YLD
Uttered	UTRD	Wait	AS	You	U
Utterly	UTRLI	Warrant	WRNT	Young Lady	YL
Vacant	VCNT	Water	WTR	Your	UR
Vacate	VCT	Watts	W	Zero (Number)	T
Vacation	VCTN	Weapon	WPN		
Valuable	VLBL	Weather Report	WX		
Value	VALU	Wednesday	WED		
Variable Frequency Oscillator	VFO	Week	WK		
		Weight	WT		
Variety	VRTI	Welcome	WLCUM		
Various	VRS	Were	WR		
Vertical	VRTCL	West	W		
Very	VERI	What	WAT		
Vessel	VSL	Where	WR		
Vicinity	VCNTI	Whether	WTHR		
Victim	VCTM	Why	Y		
Victor	VCTR	Wife	YF		
Victory	VCTRI	Will	WL		
View	VW	Winning	WNG		
Vigorous	VGRS	Wiring	WRG		
Village	VLG	With	WID		
Violation	VLTN	Wonderful	WNDRFL		
Violent	VLNT	Word After	WA		
Virtually	VRTLI	Word Before	WB		
Virtue	VRTU	World	WRLD		
Visibility	VSBLTI	Work	WRK		
Visible	VSBL	Worry	WRI		
Vision	VSN	Would	WUD		
Visiting	VSTG	Wound	WUND		
Volume	VOL	Wreckage	RKG		
Volunteer	VLNTR	Wrong	WRNG		
Voted	VTD	Year	YR		

"The French Atlantic Affair" is a novel written by an amateur radio operator. It is a story about a passenger liner that is hijacked on the high seas. Naturally, it involves amateur radio. One of the passengers erects an unobtrusive antenna and establishes a schedule with a stateside amateur in an attempt to obtain help. The story includes all the ingredients that usually prove to be interesting. ABC-TV is spending 6.5 million dollars to produce this novel as a 6-hour TV production. The three 2-hour segments will be broadcast by ABC-TV stations sometime in November 1979.

Novices are urged to submit good black-and-white pictures of themselves at their operating positions. If your photograph is printed in a future Novice column, you will receive a one year subscription (or renewal) to *CQ*. A brief description of operating activities and some personal background information are needed with your picture. 73, Bill, W6DDB



the Ultimate IAMBIC PADDLE

- Full range of adjustment in tension and contact spacing.
- Self-adjusting nylon and steel needle bearings.
- Solid silver contact points.
- Polished lucite paddles.
- Precision-machined, chrome plated brass frames.
- Standard model has black, textured finish base; deluxe model is chrome plated.
- Heavy steel base; non-skid feet.

WRITE FOR LITERATURE

BENCHER, INC.

333 W. Lake Street, Dept. D
Chicago, Illinois 60606 • (312) 263-1808

Available at selected dealers or send $39.95 ($49.95 for chrome model) plus $2.00 shipping and handling. Overseas amateurs invited to request quotation for air parcel post shipment.

CIRCLE 4 ON READER SERVICE CARD

YOUR HAM TUBE HEADQUARTERS!

TUBES BOUGHT, SOLD AND TRADED
SAVE $$$ – HIGH $$$ FOR YOUR TUBES

MONTHLY SPECIALS

3CX1000A7/8283	$285.00	572B	$27.50
3CX1500A7/8877	280.00	811A	10.80
3-500Z	79.95	813	28.50
3-1000Z	205.00	6146B	4.95
3WP1	24.00	6360	4.75
4-125A	42.00	6883B	5.25
4-400A	52.00	8122	54.00
4-1000A	275.00	8236	22.00
4CX250B	29.50	8908	5.25
5DEP1	18.00	8950	4.75

BRAND NEW * * * * FACTORY GUARANTEED
TOP BRAND Popular Receiving Tube Types.
Factory Boxed. FREE LIST Available—
Includes full line of RF Power Transistors.
Minimum Order $25.
The intelligent Ham alternative to CB
Two meter mobile 40watt RF power transistor
2N6084–$16.00.
Linear RF transistors in stock.
Eimac Tubes & Accessories in Stock
Write or phone for free catalog.
TUBES—BOUGHT, SOLD AND TRADED
Premium Prices Paid for EIMAC TUBES
CQ

CeCo

Use toll free no.
800-221-0860

COMMUNICATIONS, Inc.
2115 Avenue X
Brooklyn, NY 11235
Phone (212) 646-6300

SERVING THE INDUSTRY SINCE 1922

CIRCLE 7 ON READER SERVICE CARD

Want to get high on our lowest band? Build this vertical antenna over a weekend.

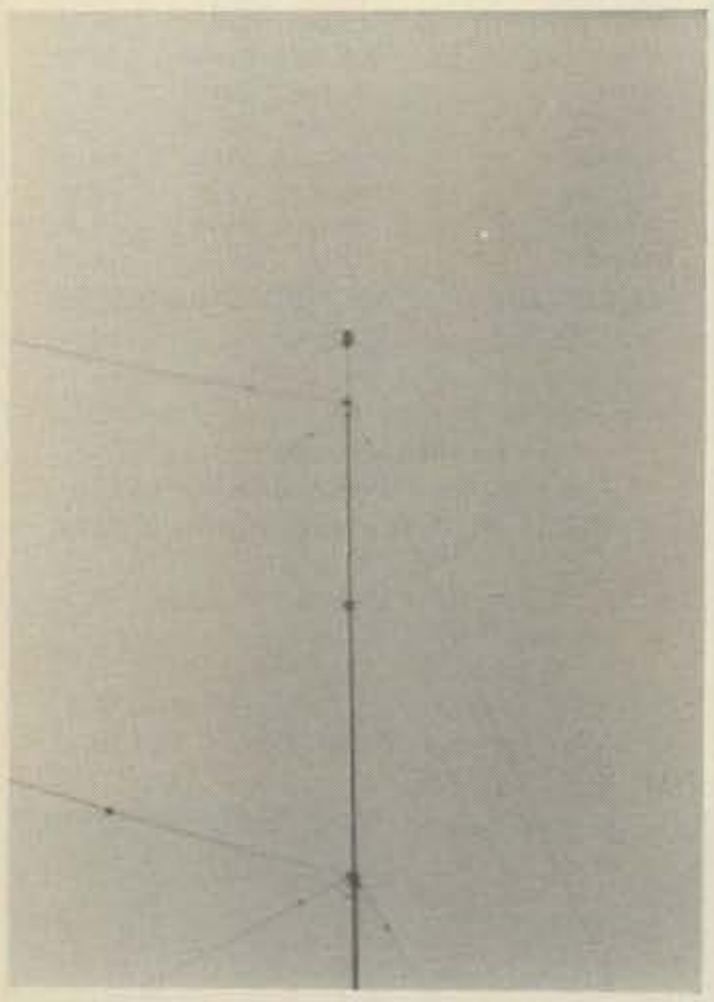
A 160-Meter Vertical Antenna

BY ROBERT G. EVANS*, K6QAY AND A.E. "DOC" NELSON*, K6ZHJ

The top-loaded vertical described in this article has been in use for a number of years in the Southland.

How many times while in QSO have you heard something like this? "Break, break. This is Station XYZ loading up my 40-meter dipole with an XYZ tuner. How do you copy me, old man?" You come back to him with a 5X9 report for he is about 10 miles away, but the rest of the group cannot hear him because he is only putting out a ground wave. He comes back with something like this: "That's funny. I copy all stations. Wonder why they can't hear me." If you are satisfied with this sort of condition, you are wasting your time reading this article. If you are not, read on.

*10509 Collett Ave., Granada Hills CA



The 160-meter vertical antenna. The capacity hat can be seen near the top.

The height required for a full 1/4 wave vertical on 160 meters and the realization of high radiation resistance are quite impractical for the average amateur on a city lot. 130+ feet high would be out of the question. However, if the lower end of the vertical is grounded and electrically lengthened with a loading coil at its base, it will resonate at the same frequency as a grounded 1/2-wave vertical 260+ feet long. The directional characteristics will be the same as a 1/2-wave dipole in free space. Remember, we said, *resonate* not *radiate*. The shortened vertical will have a loss of 5.5 dB in comparison to the full 1/2-wave at one mile distant.

Now let's take a good look at our ground system. The actual power radiated from the antenna is the difference between the total power and the power dissipated in the ground resistance. Some poorly constructed vertical antennas have been shown to radiate 4% of the available power. The remaining 96% will be lost and dissipated in the loading coil and ground itself.

If, for instance, the ground resistance is equal to the radiation resistance, only one-half the power available at the antenna will be radiated; the other half will be lost in the form of heat in the ground and coil resistance. (*Air Force Antenna Manual* - Vol. 52-19 p.119).

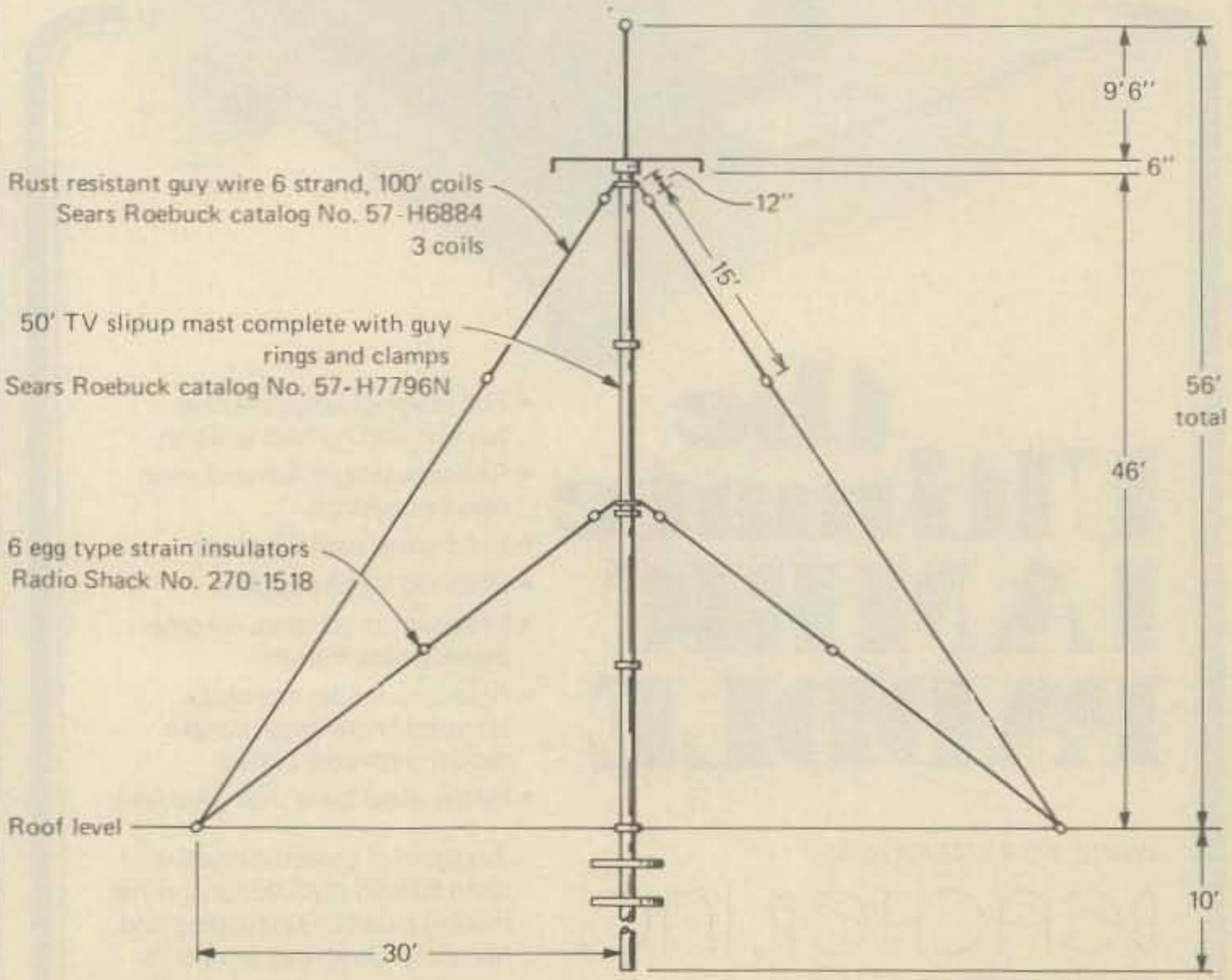
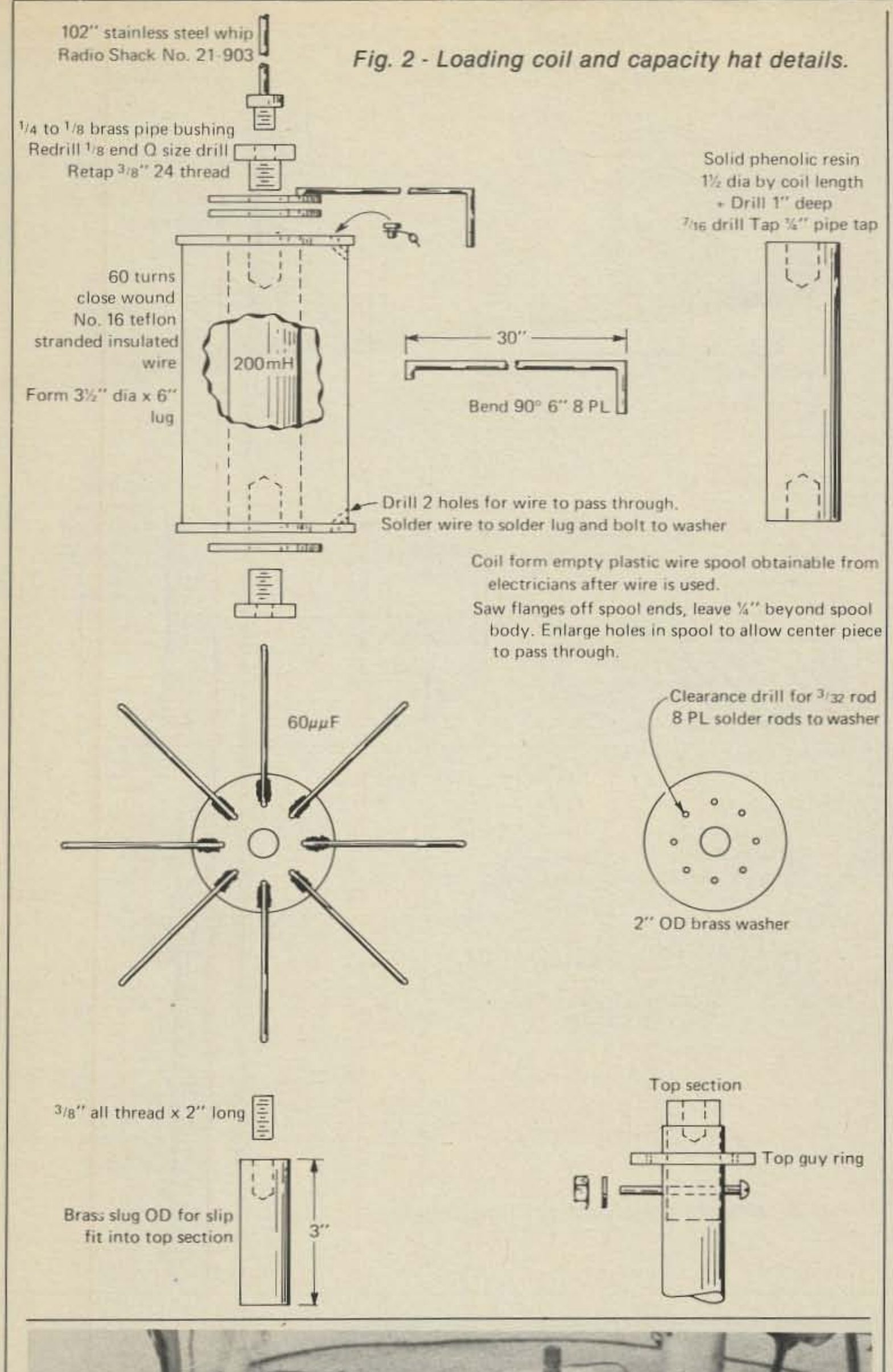


Fig. 1 - An overview of the antenna's dimensions.

Fig. 2 - Loading coil and capacity hat details.



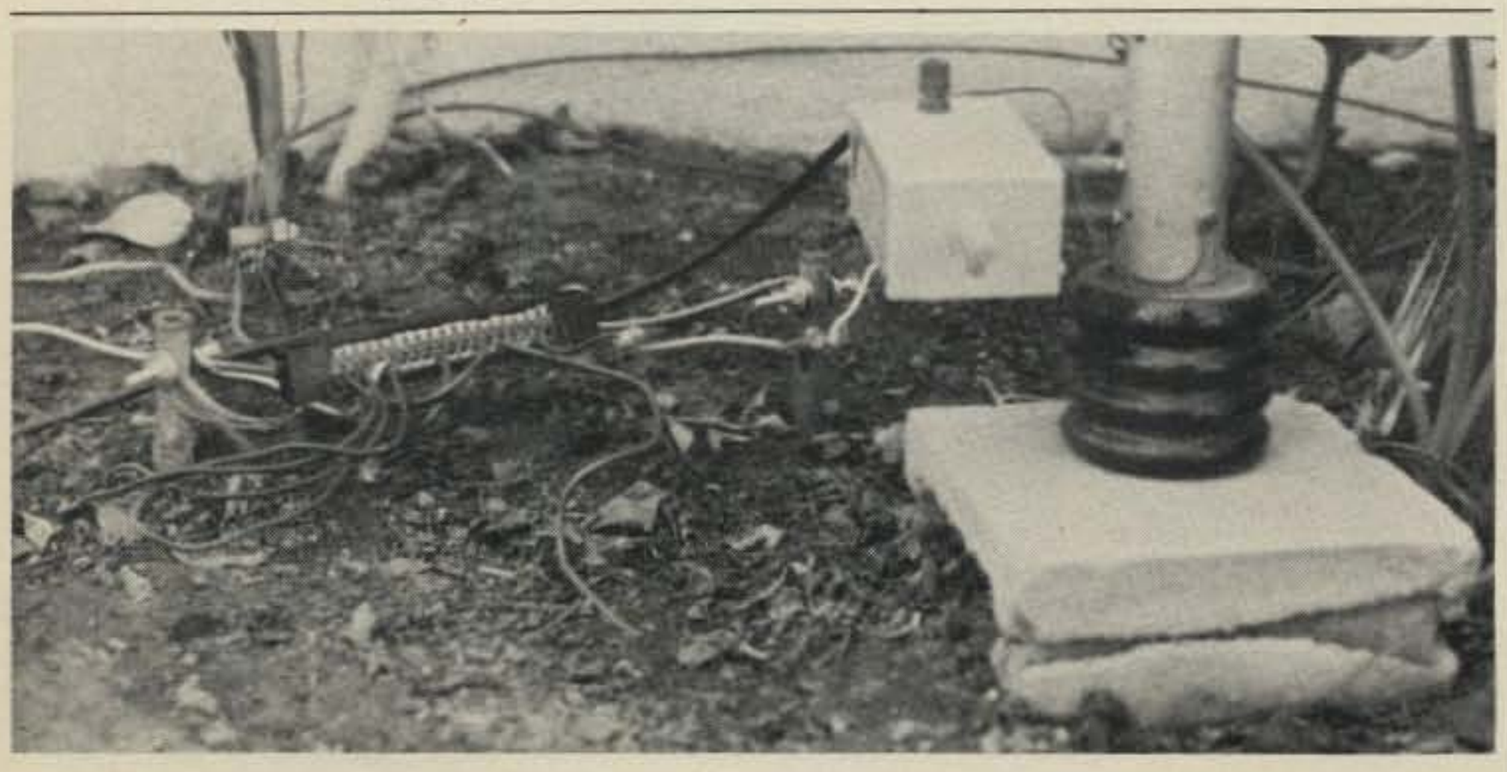


Photo of the antenna's base. See text for explanation.

A fairly efficient ground can be made by driving four copper-clad 8-foot pipes into the ground at the corners of a 10-foot square. The tops of the pipes are bonded together with #14 or larger wire.

You may want to improve this as I did. Drill four (6" diam.) holes with a post-hole digger. Obtain approximately 40 lbs. copper sulphate (bluestone). Mix with an equal amount of pea gravel. Drop the rods into the center of the holes. Shovel in the 50/50 mix. Let the water hose run into these holes very slowly for 24 hours. This will allow the copper sulphate to practically dissolve and seep into the ground around the rods. Approximately 24 hours later you will have 4 grounds, 24" diam., tied together with #14 wire which will be a substantial improvement over the water pipe ground. Next, tie in the water pipes, sprinkler systems, etc. Install whatever number possible of buried radials. These radials need not be in a straight line. Try to have at least 2 radials beyond a 1/4-wave. Do not have the radials more than 6 inches into the ground as the surface moisture may not reach much deeper than this.

After you have improved the ground systems the ratio of radiated power to power loss in the ground connection can only be increased further by increasing the radiation resistance of the antenna. The radiation resistance, as measured at the base of the antenna, may be increased by: (1) increasing the actual length of the antenna to a greater length than 1/4-wave or (2) increasing the electrical length of the antenna by inserting a lumped inductance in series with the antenna or (3) using a horizontal flat top or top hat which causes the antenna current loop to move upward on the vertical thus decreasing the current near the ground or base of the antenna.

Since procedure no. 1 is again out of the question, nos. 2 and 3 will be considered. Install a coil on the top of the mast, a top hat and a whip above the coil. The length of the whip is very critical and could very well put you clear out of the ball park if made much longer or shorter than the callout. Now to proceed a step further. Add enough turns on the coil and enough top hat and whip, thereby adding enough capacitance to the antenna for it to resonate at a frequency much lower than we wish to operate, approximately 1750 kHz. Next, install a variable capacitor in a weather-tight box at the base of the antenna, in series with the feed line and the antenna just above the base insulator. Excite the antenna with a low level signal at the frequency desired to operate and tune the

capacitor for a 1 to 1 standing wave ratio.

I chose 1818 which allows me to QSY between 1810 and 1825 without having to retune. Remember, however, that the 1 to 1 standing wave ratio will only be had at the frequency your transmitter was tuned to when you set your variable capacitor. In this installation the variable capacitor is padded with a fixed transmitting capacitor. The combination should be large enough to cause you to use from 75% to 90% of the maximum capacity of the variable for best transfer of energy. (.0004 - fixed; .0003 - variable.) The completed antenna, if you have followed instructions, will grid dip at approximately 1750, + or − 10, and will tune back into the 1800-1900 segment with a standing wave ratio of 1 to 1.

I am using 52 ohm coax with this system and the impedance is a 1 to 1 match. This eliminates the ground loss that would occur with a resonant antenna, not using series tune and not matching the input line.

All complicated math has been left out of this article. Instead, a complete list of instructions and parts callout, including snapshots and diagrams, have been including to enable you to build a complete 160 meter vertical antenna, with little difficulty. A photo and drawing are also included for an alternate base and wall mount as the insulators I am using may not be readily available to you. A grounding switch is used in case of electrical storms. Please include this as it may save your entire station. The antenna mentioned in this article has worked very well within a radius of 100 miles at high noon; into the midwest in the early evening hours; and to the east coast in the late evening hours with approximately 70 to 90 watts to the antenna. It has withstood 70 miles per hour gusts of wind with the only movement being in the stainless steel whip. You have just gained back a portion of the 5.5 dB loss, for the antenna in this article is within 2 dB of the 1/2-wave dipole at approximately 60 feet high.

The antenna at this location is attached to the side of the garage. The bottom 10 foot section tops out at roof level, standing on the roof. One man can telescope it up without any difficulty. The first section should be installed with a level as it must be plumb in both directions. The TV mast will be self-supporting if no wind is blowing. The guy lines may be attached, left loose until the mast is fully extended. Start with the top section. Pull it out of the nest of tubes until it is slightly above the pin hole. Insert the pin and secure the L bolt in the locking collar. Continue with the rest

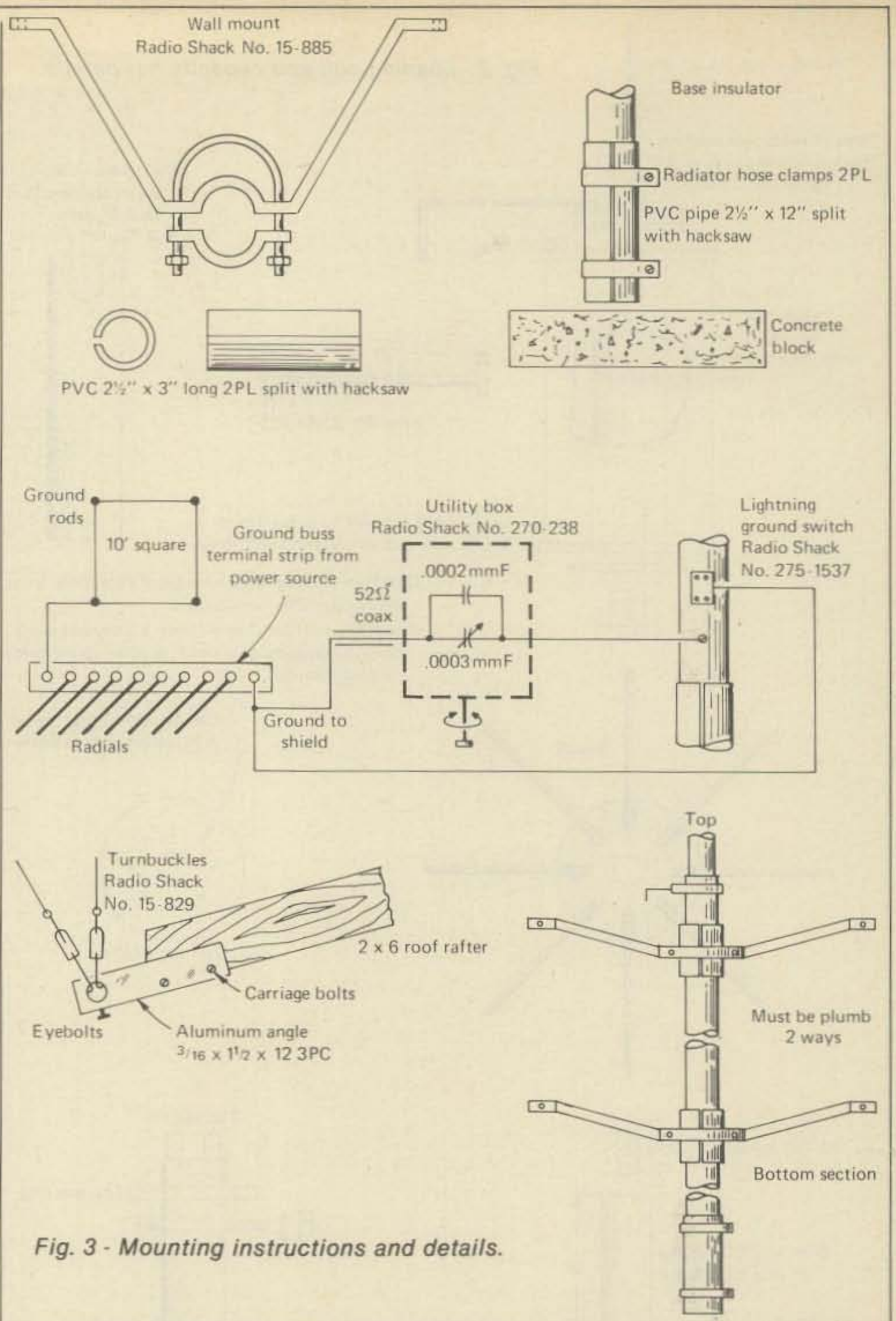
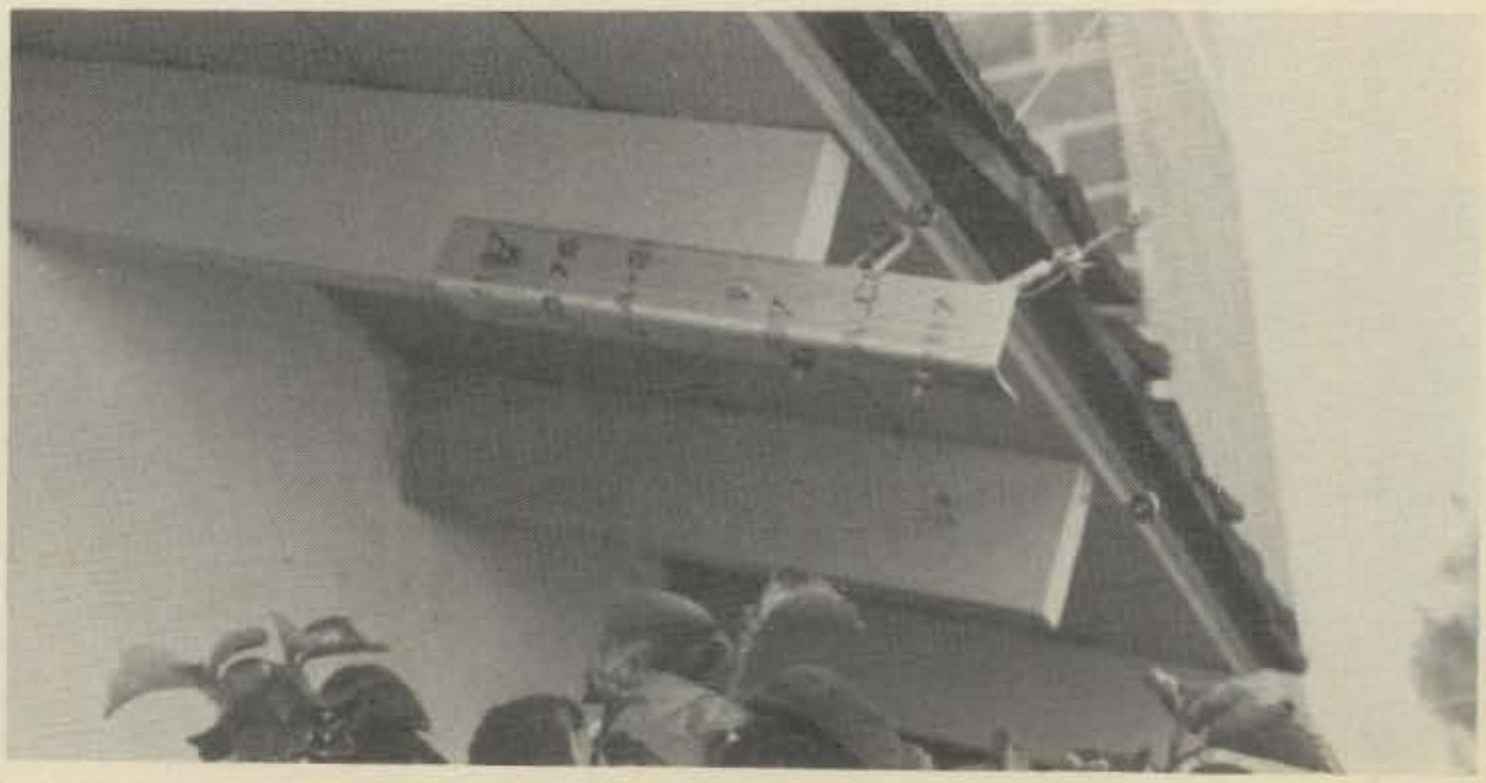


Fig. 3 - Mounting instructions and details.



This photo shows how the guy wires are mounted under the eave of the house.

of the sections until you have it fully extended.

CAUTION: As this is an all metal mast, *watch for overhead electrical wires.* **You could be electrocuted** if the mast were to fall across the lines. As this antenna is top-loaded above the coil the first guy wire insulator should not be more than 12" away from the mast as you do not want to introduce any more distributed capacitance below the coil than is necessary. This antenna has been duplicated by several other amateurs in the San Fernando Valley. All who have stayed away from base loading have had comparable reports. No antenna is without faults and this one is no exception. It has a tremendous ground wave so it may cause some interference problems to HiFi installations, also telephone and TV. This is not the fault of the antenna installation and may all be taken care of by following the instructions in the *Radio Amateurs Handbook*, 1978 Edition, pages 492-505.

Listen for us any evening, 1818 -1820, between 6 p.m. and 8 p.m. PST.

Editor's Note

This might be a good time to get one of these up. Remember the *CQ* 160 WW DX Contest is coming up in January.

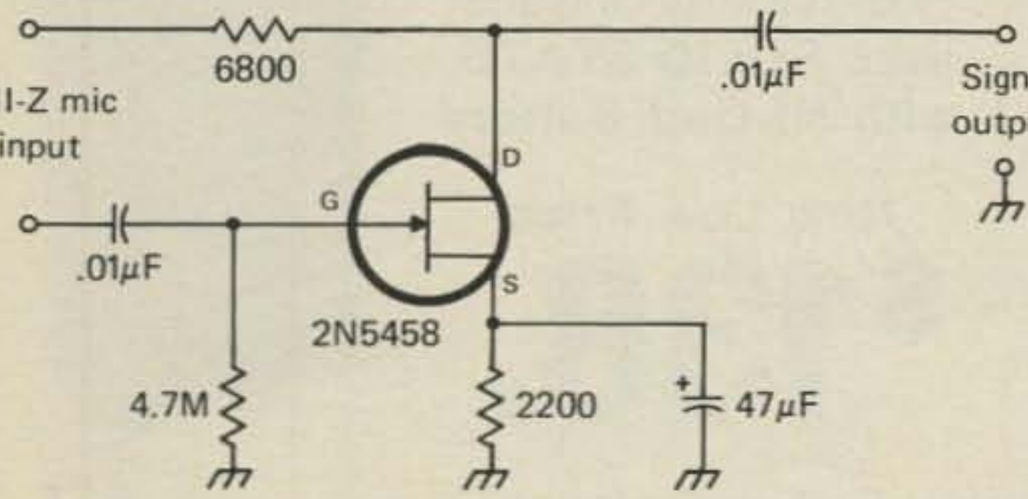
Material Callout

Quantity	Description
☐ 1	Base insulator PVC pipe
☐ 2	Radiator hose clamps
☐ 2	PVC pipe 1st section wall mount insulation
☐ 4	5/16 X 2 1/2 lag bolts to secure wall brackets
☐ 12	Strain type insulators
☐ 300 ft.	Guy wire
☐ 1	102" stainless steel whip - w3/8" - 24 THD stud
☐ 1	Top loading coil form
☐ 65 ft.	#16 Teflon TM insulated wire stranded
☐ 2	Solder lugs
☐ 2	6-32 bolts, nuts and lock washers
☐ 8	PC 3/32 X 3' brass welding rod
☐ 3	2" OD brass washers - w3/8" center hole
☐ 2	1/4" to 1/8" brass pipe reducer bushings
☐ 1	3/8" 24THD all THD stud X 1 1/2" long
☐ 2	3/8" lock washers
☐ 1	Brass slug to fit inside of top section of mast
☐ 1	10-32 bolt X 2" long with nut and lock washer to secure slug into top section
☐ 1	50' TV slipup mast
☐ 3	PC aluminum angle
☐ 6	1/4" X 3" carriage bolts, nuts, flat and lock washers
☐ 3	1/4" eye bolts with 2 nuts and lock washers each
☐ 6	Turn buckles
☐ 1	.0002 Fixed mica trans capacitor
☐ 1	.0003 variable - can be receiving spacing
☐ 1	Utility box to house capacitor with mounting hardware
☐ 1	Phenolic resin or teflon 1 1/2" diam. X length of coil to extend flush through coil form
☐ 1	Knife grounding switch
☐ 1	Concrete block

CRANIUM QUERIES

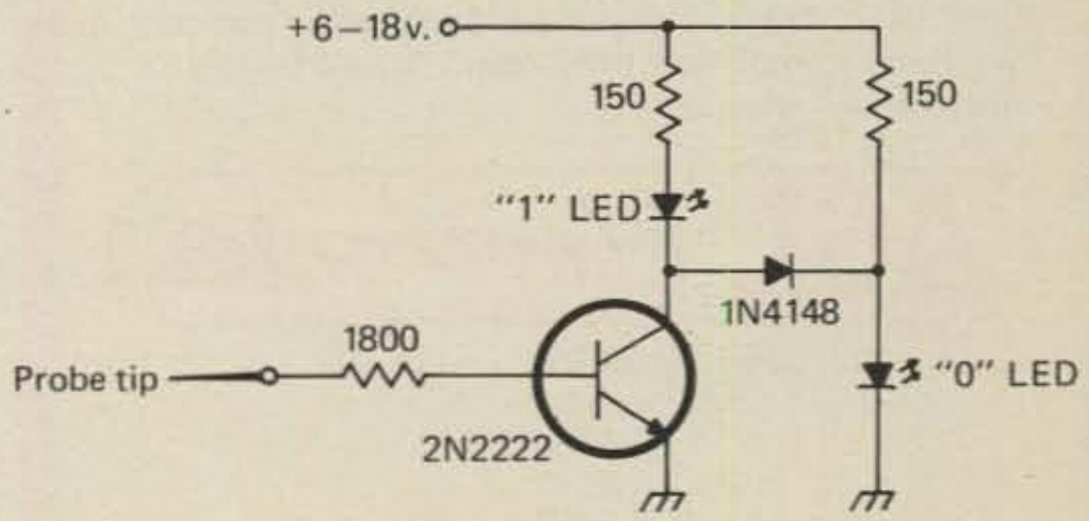
" FIND THE ERROR"

BY MARTIN BRADLEY WEINSTEIN, WB8LBV
130 Coe Avenue, Apt. 73
East Haven, CT 06512



Here's What Was Wrong.

There's not much signal available at the source, but there's plenty at the drain. So a little physical QSY of the output cap provides an ample preamp.



What's Wrong?

The idea behind this Logic Probe is pretty straightforward: a "Hi" logic level turns on the 2N2222, which turns on the "1" LED: a "Lo" turns off the "1" and turns on the "0". They just stay on and change brightness. Whahoppened?

(Solution next month)

HOW TO GET SOMETHING FOR NOTHING.

When you decide it's time to upgrade or add to your station, remember AGL. Our only business is amateur radio — not CB equipment, stereo equipment, or burglar alarms. Whether you talk to Gordon, N5AU; Bill, K5FUV; or John, WB5IIR; you'll find an Extra Class licensee at your service. And, you'll find our practical experience includes station design for just about any type of radio operating. From DXing to DXpeditions. From HF to VHF. From repeaters to SSTV. We'll recommend quality equipment based on your needs, rather than flowery reviews and pretty magazine advertising. That's extra class.

We carry quality brands including: Yaesu, Drake, Swan, Atlas, Ten Tec, ETO, Dentron, Icom, NDI, Midland, VHF Engineering, Hygain, Cushcraft, Mosley, HiReli, F9FT Tonna, Larsen, Decibel Products, Hustler, Electrospace, Rohn, CDE, B&W, Vibroplex, Bencher, MFJ, Redi-Kilowatt, Microwave Modules, Sherwood, Fox-Tango Filters, Daiwa, Mirage, Robot, Xitex, Bird, Telex, Astron, Shure, Amphenol, Cover Craft, Ameco.

And, believe us, that's just the beginning.

Now, many of you have always wanted to get something for nothing. Remember, AGL isn't just another "800" number. But, to show you that our prices are more than competitive with these fellows, we invite you to call us direct at:

1-214-241-6414

If you place an order that exceeds $100, we'll credit your sales ticket for $2 (about the cost of your three minute phone call). In effect, we're giving you the phone call free. Just like the "800" boys. But, this way, you'll find out we have something they don't: great prices *and* sound advice.

AGL *Electronics*

3068 Forest Lane, Suite 309
Dallas, Texas 75234
1-214-241-6414

CIRCLE 1 ON READER SERVICE CARD

Call or Write for Delivery or Quote

KENWOOD TS180S

LEAVE A MESSAGE & WE'LL CALL YOU BACK!

W5GJ, W5MBB, K5AAD, N5JJ, AG5K, W5VVM, W5EGP, WA5TGU, WB5AYF. K5BGB.

MADISON
ELECTRONICS SUPPLY, INC.

1508 McKINNEY • HOUSTON, TEXAS 77002
713/658-0268

MASTERCHARGE • VISA

DLA

CIRCLE 27 ON READER SERVICE CARD

GREGORY ELECTRONICS
The FM Used Equipment People.

2 Meter Portable

G.E. MASTR PR 36
132-150 MHz - 5 Watts
ALL SOLID STATE
with Ni-Cad Battery

New Low Price

$138.

Vehicular Charger 4EP63A (sold only with unit) **$25.**

master charge
VISA

GREGORY ELECTRONICS CORP.
249 Route 46, Saddle Brook, New Jersey 07662
(201) 489-9000

Please send all reader inquiries directly

a monthly feature by

IRWIN MATH, WA2NDM

Math's Notes

A look at the technical side of things

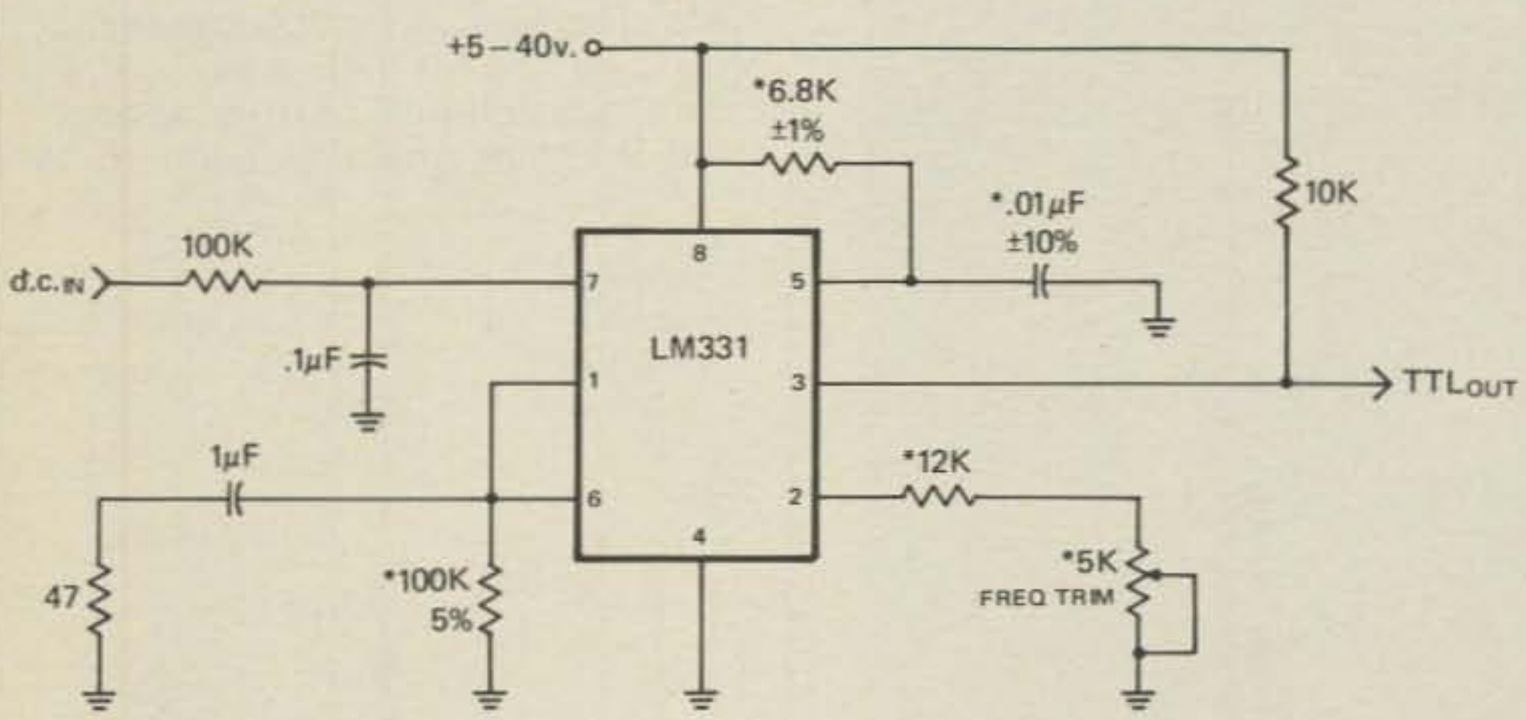


Fig. 1 - All starred components should be stable parts for best results.

There is an interesting integrated circuit that we have been using in the development of a new line of products that greatly simplifies the transmission of various types of DC control signals and we thought that some of our readers would find it interesting. The device is the National Semiconductor LM331 voltage to frequency converter. This chip accepts a DC voltage input and converts it to a TTL compatable highly linear pulse train which is directly proportional to the input DC. The conversion rate is 1000 pps per volt and the upper frequency limit, 10,000 pps and 0 to 10 volts can be handled. Typical linearity is 0.1% or better so precision signals may be accommodated.

Before discussing actual applications, let us first refer to fig. 1, which is the basic circuit for the LM331. DC voltages over the range of 0 to 10 volts are applied to the chip through a 100K and .1uf low pass filter which attenuate rapid variations in input and increase stability of the circuit. The output from pin 3, is a simple TTL compatable logic level pulse that corresponds to the input DC Valve.

5 Melville Lane, Great Neck, N.Y. 11020

A 5K pot is also provided to adjust the output frequency for calibration. You will notice that various tolerances and types of components have been specified. This is necessary to preserve the extreme accuracy of the voltage to frequency conversion which is possible with the chip. By careful choice of these components, linearities of ± .05% can be easily achieved.

The circuit in fig. 1 has a number of interesting applications by itself. For example, if the output is applied to a frequency counter, the counter will act as a simple DVM with a full scale reading of 10.000 volts (1 mv charges could be resolved). If the input were to be a thermistor bridge, then the output counter would read temperature directly. The DC output from the indicator in an antenna rotator could also be displayed in degrees with suitable trimming. In fact, any transducer producing a DC output could be easily "digitized" by this circuit.

But we have only looked at half of the circuit. The LM331 can also be used "backwards" as a frequency to voltage converter. Here, the input pulse train is converted back into the original DC voltage with the same general accuracy as fig. 1

This configuration is shown in fig. 2. As in the first case, a pot is provided for calibration. The output of the LM331 is also applied to an op-amp follower to allow low impedance loads to be driven. This op-amp is a single power supply type to match the LM331.

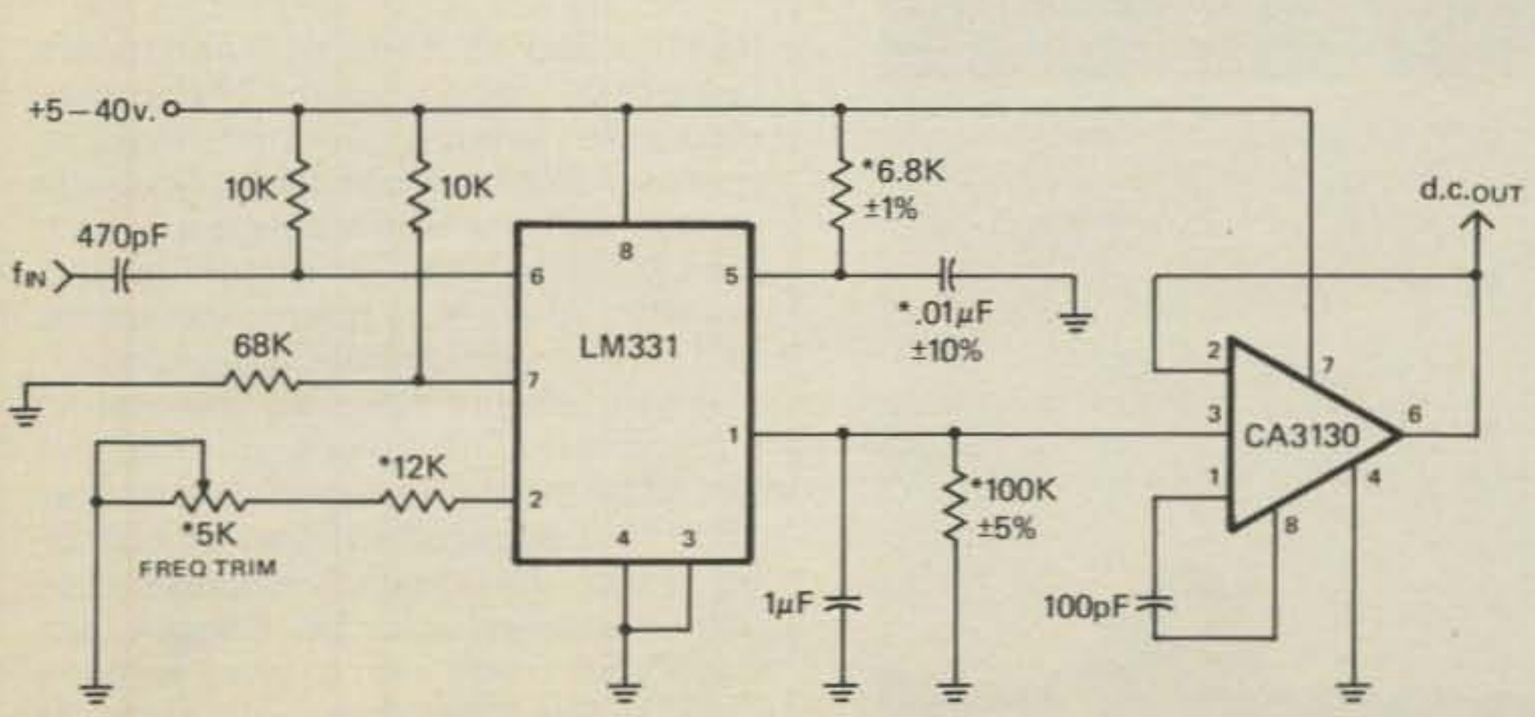


Fig. 2 - Frequency to voltage converter again, all starred components should be stable.

How You Can Convert Your Rohn 25G Tower to a FOLD-OVER

CHANGE, ADJUST OR JUST PLAIN WORK ON YOUR ANTENNA AND NEVER LEAVE THE GROUND.

If you have a Rohn 25G Tower, you can convert it to a Fold-over by simply using a conversion kit. Or, buy an inexpensive standard Rohn 25G tower now and convert to a Fold-over later.

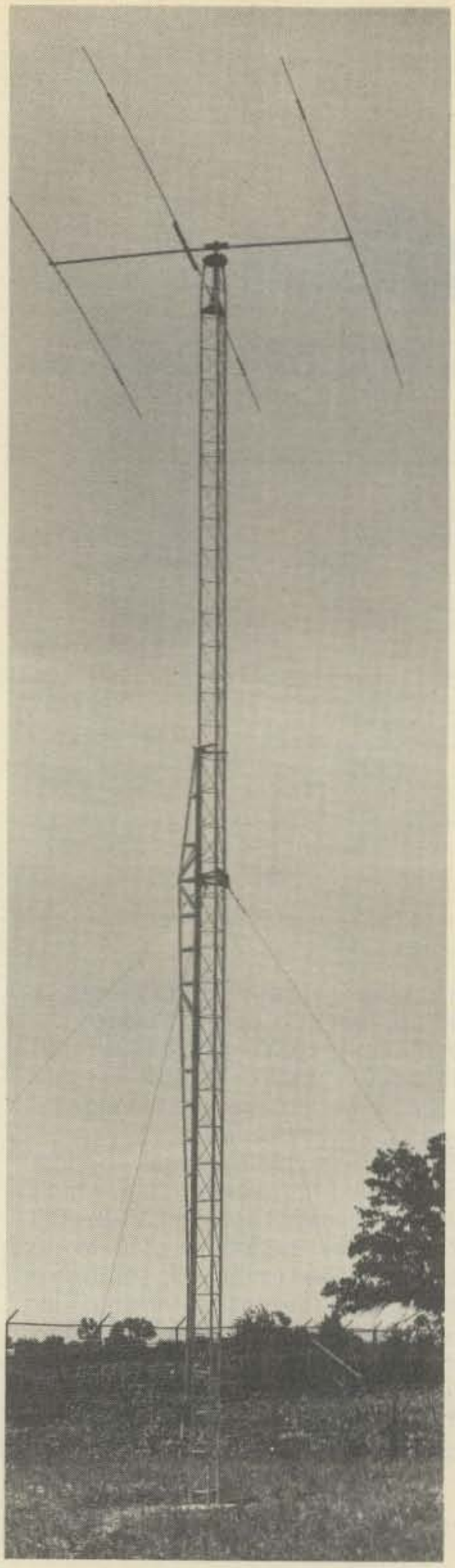
Rohn Fold-overs allow you to work completely on the ground when installing or servicing antennas or rotors. This eliminates the fear of climbing and working at heights. Use the tower that reduces the need to climb. When you need to "get at" your antenna . . . just turn the handle and there it is. Rohn Fold-overs offer unbeatable utility.

Yes! You can convert to a Fold-over. Check with your distributor for a kit now and keep your feet on the ground.

AT ROHN YOU GET THE BEST

Do not attempt to raise antenna or antenna support near power lines— You can be KILLED.

Unarco-Rohn
Division of Unarco Industries, Inc.
P.O. Box 2000, Peoria, Illinois 61601



The connection between the F/V circuit and the V/F circuit offers a number of interesting possibilities. It can of course be twisted pair leads, or even coaxial cable, but for true versatility, it can be a transmitter/receiver combination. Fig. 3 shows how simple this interface can be. The only point to keep in mind here is that the maximum frequency being transmitted is a full 10 KHz and the minimum, somewhere around 10Hz. Therefore, the modulator must allow these to pass or you will simply lose signals. This fact may pose equipment problems on the low bands, but should be fine for VHF work.

The possibilities of this arrangement are numerous. In addition to

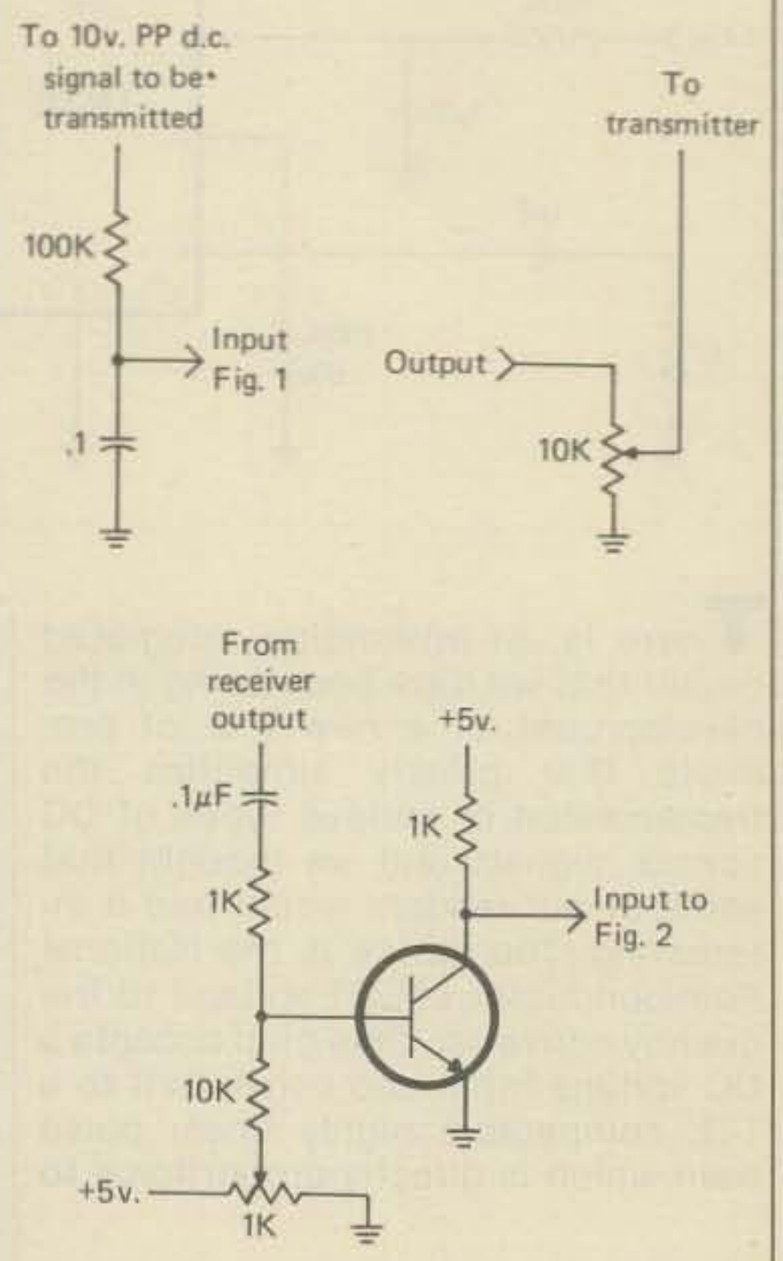


Fig. 3 - Input/Output interface methods.

transmitting all sorts of transducers remotely, one would fabricate elaborate analog control sytems, perhaps even remote tuning circuits (motor and variable capacitor?) with the LM331. In addition, direct interfacing with all sorts of microprocessors, and other logic circuits are possible.

If you should have an interesting application of this versatile chip, we would be most interested. Full details and other applications can be obtained from National Semiconductor, 2900 Semiconductor Dr., Santa Clara, Ca. 95051. If you plan to work with the LM331, the date sheet will be quite helpful.

73, Irwin, WA2NDM

CIRCLE 38 ON READER SERVICE CARD

This month by
ROD LINKOUS, W7OM

DX

News of communications around the world

Chasing DX effectively takes more than one would think. Receivers, transmitters, transceivers, antennas, and on goes the list. Skill is the next item after hardware.

A DX Aid - The DX Bulletin

For many years, every Monday evening I looked forward to getting my DX bulletin. It came with such regularity that when it was a day late, I was tempted to write the Postmaster General a nasty letter.

One Monday I rushed to the stack of mail for the trusty 8 to 10 page bulletin. As usual it was there. Reading the bulletin was always a joy. Yet, this time it was not. The editor had announced the work had gotten past the overwhelming stage and this was the last issue.

PANIC! The demise of the bulletin was the end of an era. More importantly it was the loss of my biggest aid to chasing DX. It has been my extra set of ears. It provided the means to chase the rare few I needed without those many hours of listening. It told me when and where to find the elusive rare country. It also told me how to get a QSL card. DXpedition schedules were keys to my vacation planning. Often it told me when to take a day off from work. Above all it was the best spent money in DXing for it amused and informed. But where and how to replace my valuable DX aid?

The bulletin I am refering to was the *West Coast DX Bulletin*. Under the stewardship of Hugh "Cass" Cassidy, WA6AUD, it hit the mail weekly for eleven straight years. Recently it went to 3,200 DXers around the world.

Unfortunately for all of us, success was one of the means to its end. The tremendous dedication and tenacity of Cass led to a reputation of high credibility. What he wrote was not only enjoyable to read, it was factual.

This dedicated DXer gave more to

*5632 47th Avenue S W
Seattle, Washington 98136

Cris Gondard, FB8XV, at the controls during a break from his engineering chores. The TR-4 along with a linear puts out a good signal despite a marginal antenna. The receiver is a little on the tired side. The Hallicrafter station is an alternate. (Photo FB8XV)

the DX community than most. It is indeed unfortunate that it takes the absence of the bulletin for us to realize that fact. A couple of abstracts from Cass' farewell letter to the subscribers may give us all a better appreciation of the dedication of all DX bulletin editors.

> "When we topped the 1,600 subscription mark we said that we had had it. That a rubber band would only stretch so far before snapping and we were close to that point. It hardly slowed things at all.

Even when we got *QST* and *CQ* not to mention the bulletin in the DX columns, the growth continued. In 1978 we knew we were in trouble and by late fall we were working non-stop on the bulletin. From November 5th to February 17th there was no day that we worked less than four hours on the bulletin, every week during the production period we would have two or three fourteen-hour work days. The long stretch of non-stop working continued through the spring of this year and up to the present and only for brief periods were we able to get away from work on the bulletin. By late spring it was obvious that the staff, as well as the equipment, was just wearing out.

"At this point in July the bulletin has been published every week for over eleven years. It was started on May 1, 1968 and has shown every week since. The total number of issues is just at the 600 mark and it has been a long string without a break.

"The Marin County DX Group (*ed. the reported publisher*) has never been more than two persons. The XYL wrote the receipts, slapped on

The French base on Kerguelen; Port aux Franjais "Frenchmen Harbour". The home for 80 during the summer and 60 in the winter. Mt. Roos, 1,900 meters high about 50 miles from the base is the dominant point of the archipelago. (Photo FB8XV)

Pierre, FB8XU, who's home call is F6FLZ was another of the Kerguelen team until severely injured in an accident and was sent to Reunion. (Photo FB8XV)

the ever-increasing list of address labels and helped with the fold and stapling. All of the rest of the work was done by the other member of the Marin County DX Group. The writing, the sparse DXing, the printing and the record-keeping. The writing itself was always a bit of a challenge as the bulletin was usually straight out, one pass and that was the copy. This eventually became more and more essential as the work load grew though it was at times embarrassing to note how a tendency had developed where word endings, or even parts of a word, would be dropped. We knew what was intended to be said but with the high-speed typing there were times when it did not come out just as planned."

I want to, on behalf of the DX community, publicly recognize the contribution made by Hugh Cassidy and his wife. We are all blessed by having had the pleasure of the *West Coast DX Bulletin* these many years. We will all miss the epics of Red Eye Louie, his cousin Sunspot, the Old Timer, the QRPers and the Leader of the Palos Verdes Sundancers. We will miss his wit and enjoyable style. We hope that the future will allow Cass to return to the pileups and to the pages of this column.

To all of the DX bulletin editors, we would like to extend our thanks for your untiring efforts. We know your dedication has enhanced our hobby.

So when you get your next bulletin, remember the work it took to make your reading possible. The invisible editor does it for the love of the hobby and not the small amount of money involved. He also needs your help to make the next issue informative.

By the time you read this, *The DX Bulletin* should be in print. It will attempt to fill the void. Jim Cain, K1TN, a noted writer, will be the editor. All queries regarding the new bulletin should go to:

Jim Cain, K1TN
306 Vernon Avenue
Vernon, CT 06066

Another link to home. The supply ship "Mario Decfresne" setting the Frenchmen Harbour. (Photo FB8XV)

The WAZ Program

10 Meter Phone

17...ON4UN
18...W5UAW
19...I1YG
20...N4PN
21...W5KHT

15 Meter Phone

17...K5OVC
18...ON4UN
19...JA2HXV

20 Meter Phone

240...ON4UN
241...WA2AUB

20 Meter C.W.

84...N4PN

All Band Worked All Zones

S.S.B.

1687...W2MPI
1688...WA2WRC/CX
1689...W5RTG
1690...CX2XC
1691...WA2YUH
1692...W1KSZ
1693...WA9BHH
1694...K9BB
1695...W8IMZ
1696...HB9ARE
1697...WB9BKH
1698...WA6OTV
1699...W2IJB
1700...WA6DTG
1701...WA2AUB
1702...PA0JPM
1703...AI5I
1704...AD7Z
1705...W6ILH
1706...K9UAA
1707...HI8XGF
1708...F6DZU
1709...WA2DXJ
1710...JH6RYY
1711...WA1PEL
1712...AB5C
1713...OZ2YE
1714...W6PYK
1715...VE4AT
1716...WA1GBA
1717...K5TGE

C.W. and Phone

4594...K0EDQ
4595...JR1ARK
4596...KL7HMO
4597...W7JAL
4598...K6YK
4599...W2CKR
4600...W1HSP
4601...K9HI
4602...K9BJ
4603...WA4WYN
4604...K3FN
4605...JA7AS
4606...I5BOL
4607...N4IB
4608...JA2IDN

The complete rules for WAZ are found in the May 1976, issue of *CQ* Magazine. Application blanks and reprints of the rules may be obtained by sending a self addressed stamped envelope, size 4½ x 9½ to the WAZ Manager, Leo Haijsman, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards direct to the WAZ Manager or a check point, should include sufficient postage for the safe return of their QSL cards. Please note that effective June 1, 1979, the processing fee for all *CQ* certificates was raised to $5.00. This fee must accompany all applications.

Chris is on the great island, named "Great Island". The archipelago discovered by Kerguelen around 1750 has been under French rule since. He describes the location as the South Indian Ocean just under the Roaring Forties in the subAntartic region. Yet the temperatures range from highs around 20° C (68° F) to lows around -15° C (5° F) in the winter. It rarely gets below 5° F near the sea, yet in the high mountains above 1,000 meters the temperature drops below -22° F. Doesn't sound like the Antartic.

The country is very wild, no trees, some grass near the sea and in the valleys, and a lot of rocks. It is almost volcanic.

In 1970, when Chris turned 16, he received his first amateur license. He operated club stations while pursuing his studies. Then he bought a Ten Tec Argonaut and the QRP bug bit. He has worked some sensational DX with the 3 to 4 watts.

He prefers c.w. but is found often, when conditions and duties permit, on 14225 MHz with the W7PHO Family Hour. He is also ARV on Oscar with both 28/144 and 28/432 converters and multiple yagis.

Chris will be headed back to France the end of February 1980 "if the ship doesn't forget us." First stop Reunion. He plans to stay in Reunion about two weeks. Then onto Mauritius (3B8) and Seychelles (S79). He will be back in France around the middle of April.

Kerguelen

In a recent letter, Chris Gondard, FB8XV discusses his assignment in that rare archipelago in the South Indian Ocean. Chris is a graduate engineer specializing in nuclear physics and new materials (electronic components, chemistry and metalurgy). Amateur radio is just one of his hobbies. Photography gave us the photo shown in this article. He also like to build electronic equipment and hike.

He is in Kerguelen on contract by a French laboratory. He works in the external geophysics laboratory studying the distant border of the Earth. The studies include the magnetic field and its pertabations, the inonized layers (D to F2), austoral aurora, magnetospheric disturbances and noises from the sun.

In his spare time while not on the bottom of a pileup or building electronic projects he likes to hike around the island and take pictures of this remote island. Chris sent us far more photos than we could use, which is unfortunate as his photos of the wild life are excellent.

Remember the traditional Hawaiian sailing canoe which went from Hawaii to Tahiti in 1976? The man who navigated the canoe using ancient traditional navigation methods (stars, wave action, etc.) was Pius Piailug, a master navigator from Satawal in the central Carolines. Pius, shown at the mike, sailed the Yap canoe 600 miles (open ocean) from Satawal to Saipan. Shown with Pius is (l to r) Dan High, KG6RL; Bert Thompson, KG6SL; and Gus MacFeeley, WA1KRR/KG6. (Photo by KG6SW)

Chris's very good friend Bernard has recently received his license to operate. So Kerguelen has two operators Chris, FB8XV and Bernard, FB8XW. They both use the QSL manager services of Jean Brunner, F5VU.

Big DX Meet

Next year has a lot in store for DX-ers worldwide. High sunspot activity and new political environments. Countries will come and go. If 1979 is any indicator, 6 or 7 of the top ten most wanted countries will fall from the list.

The outcome of WARC-79 and the volatile evolution of electronics will bring new equipment into the DX world. New bands will impact almost *all* current equipment and antennas. Many of our DX awards will have to take on some new rules.

To inform the DXer and to entertain DXers, the Western Washington DX Club will be the host for what promises to be the Big DX Meet. In conjunction with the 1980 National ARRL convention, the WWDX Club will host the DX programs.

Equipment displays and programs promise to excite the DX community, newcomers and old timers alike. Several noted DXers from Asia and Europe have committed to attend.

The convention is scheduled for the last weekend of July 1980 (July 25, 26 and 27). The whole show is under one roof at the Red Lion Motor Inn convention center. It is located adjacent to the Seattle-Tacoma International Airport making Tokyo or London only one stop away.

Being from the Northwest, this DX gathering promises me a chance to meet many of you. So plan a vacation and come visit. For more information write:

BID DX MEET
SEANARC 80
P. O. Box 68534
Seattle, Washington 98168

DX Extras

DE W4FRU BT I am the QSL manager for two very active and semi-rare DX stations (ZD7HH and SNØDOG). I concur with the content of the article (DX column August 1979) in its entirety. I have noted a large number of DATE errors on incoming cards and wondered why, I looked at the clock on my own station console. At the push of a button, it displays time in GMT, 12 hour and 24 hour local and the date. The DATE is changed only on local time *not GMT*. Therefore, at some time during the 24 hour GMT day, the displayed date will be in error one day. A word to the wise - some managers may not check back or ahead one day in the log and you will receive those disappointing words "NOT IN THE LOG." AR

DE SM7BUR BT A special Swedish call, 7SK7HW, will be on the air 12 to 19 August, 1979. This activity is arranged to commemorate the many Swedish emigrants leaving for North America during the late 19th and early 20th century and also to celebrate the anniversary of the Kronoberg Radio Society. Every contact will be confirmed with a special QSL. With the QSL will be interesting material on the emigration history. AR A SASE and 2 IRCs to: 7SK7HW; Kronoberg Radio Society; P. O. Box 121; S-35104 Vaxjo, Sweden.

DE DX Certificate Hunters BT Reference recent items on certificate fees. I for one believe that the cost of the awards should be raised and that the recipients of the awards should foot the bill. There is no reason for someone else to take a financial beating in order to issue awards. If I work to get an award, paying the fee for the award is the least of my expense. Awards reflect my accomplishments and they were bought with my efforts on the air through a lot of hard work and lousy pileups. The fees spent for the award was lost in the noise. AR The preceeding item is a composite of several notes I received from a number of noted DX certificate chasers. The bottom line was: "I am proud of my certificates for the accomplishments they reflect, not the time and money they cost." Besides the postage for QSLs far exceeded the award fees.

CQ DX Awards Program

S.S.B.

720	WBØRLY	727	WA7JUJ
721	N7JB	728	WA8KEM
722	ZL1BIL	729	W1HSP
723	WBØLXM	730	WD4IHV
724	KP4EQF	731	W6ZUM
725	AA4TP	732	W7KQH
726	N4IB		

C.W.

380	K8FU	383	W1HSP
381	VE7AVC	384	WD4IHV
382	N4IB	385	W1WLW

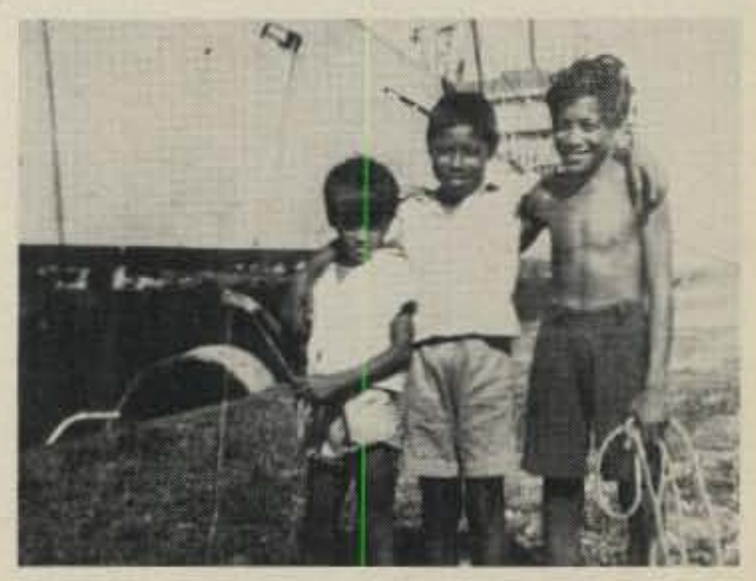
S.S.B. Endorsements

310	W6EUF/318	250	WA4JTI/287
310	W4EEE/318	250	ZL1BIL/262
310	W3AZD/317	250	W6DN/254
310	VE3MR/316	250	W8ILC/250 (QRPP)
310	WA2EOQ/315	150	KP4EQF/175
310	I8YRK/315	150	N4IB/152
310	EA4LH/313	150	WD4IHV/150
310	K9LKA/310	150	W8ØPSH/150
300	WØSD/306	150	W8LKG/150
300	HP1JC/301	28 mHz	ZL1BOQ

C.W. Endorsements

300	N6AV/308	200	AF5M/209
200	W1WLW/234	150	VE7AVC/150

Complete rules and application forms are available for the CQ DX Awards program. Send a business size, No. 10 envelope, self-addressed and stamped to: "CQ DX Awards", 911 Rio St., Johns Dr., Jacksonville, Fla. 32211 U.S.A.



Sonny Upton, WD5CSU, at the station where he arranged the passage back in time through Len Kaufer, KG6SW. The smallest of the three boys is Quirino Mendiola with his brother and cousin. The picture was taken in Ponape, Eastern Caroline Islands in about 1949. The ship is the Navy vessel "Chicot" (Photo by WD5CSU via KG6SW)

THE BIG SIGNAL®
UNADILLA
"W2AU" Baluns
Still Only $14.95
DEMANDED BY PROFESSIONALS WORLD-WIDE OVER 12 YEARS
• The Original Lightning Arrest
• 650# Strength
• Stainless Hardware
• Sealed
• GUARANTEED
ASSISTANCE? Call: HUGH GUNNISON, WA2ZOT
Toll-Free 800-448-1666
[NYS Collect 315-437-3953]

FULL-POWER, QUALITY HAM ANTENNA PARTS
AT YOUR DEALER
1:1 OR 4:1 2,000W PEP
• BALUNS-TRAPS-INSULATORS
• QUAD PARTS-ANTENNA KITS
• BOOM/MAST MOUNTS-WIRE
• CABLE-CONNECTORS
WRITE FOR FULL CATALOG
[Enclose 30¢ Stamps]
MICROWAVE FILTER COMPANY, INC
UNADILLA/REYCO DIVISION [Dept. CQ]
6743 KINNE STREET, EAST SYRACUSE, NEW YORK 13057
DEALERS WANTED – OVER 300 WORLD-WIDE
CIRCLE 32 ON READER SERVICE CARD

Dieter Schmidt, DM3TYF, busy working another, new one from his East Germany QTH.

It's A Small World

One evening on the Pacific Interisland Net I (KG6SW) got a call from WD5CSU, "Sonny" Upton. Sonny had just gotten his General class license, and wanted to talk to someone in Microsnesia. As a young man he had served in the Navy on a supply ship which used to call every couple of months at the various ports of the Trust Territory—this was back in the late forties and early fifties. Sonny still had pictures of some of the youngsters who used to come down to meet the ship whenever it came into port. One young boy whom he remembered was called "Quirino", and Sonny had a picture of this lad with two other boys standing alongside his ship, the *Chicot*. I told Sonny that I knew of only one Quirino in Micronesia, and that was Quirino Mendiola from Ponape.

Some weeks later I met Quirino when he returned to Saipan from home leave to Ponape. I told him of my conversation with Sonny. He remembered the ship well, and said that he and his brother and cousin used to watch for the ship and go down to talk to the men whenever it came into port. Sonny sent me a copy of the picture, and sure enough it was a picture of Quirino and his brother and cousin, taken when Quirino was nine years old. I later patched Sonny through to Quirino, and they have since exchanged letters and more pictures. So amatuer radio has a way of spanning the miles—and the years. (Quirino is now the Chief of Immigration for the Trust Territory, and a graduate of Michigan State.)

Pat Morton, LU1BAR/W3 is an avid DXer of note. When not working on WARC 79 activities, Pat is in the pileups chasing a new country or another award. In addition to the certificates shown, Pat has both a 5BDX-CC and 5BWAS from her Washington D.C. QTH.

The WPX Program

Mixed

764...JR6CWC
765...IT9HLO
766...N3RL
767...WA2BJN
768...KB8EC
769...K9BG
770...SM6DYK
771...W8LKG
772...I5JFG
773...WA5SOG
777...K4IEX

S.S.B.

1177...TF3CW
1178...K0RDJ
1179...N3RL
1180...JR3LGB
1181...SM5CSS
1182...JA1EN
1183...I5EFO
1184...AF5M
1185...KB8JF
1186...K4IEX

C.W.

1843...EA1JO
1844...VO2CW
1845...N3RL
1846...AA4AK
1847...SM5VB
1848...SM5AKS
1849...SM6BBX
1850...CO2OM
1851...W1HSP
1852...WB3DCT
1853...HA5LZ
1854...HA8UB

WPNX

161...WD4RXJ
162...WD9EJE

VPX

163...SWL-RAY
164...PA-3347

Award Of Excellence Plaque

K4IEX

Endorsements

Mixed: 400 JR6CWC, WA2BJN, KB8EC, SM6DYK, W8LKG, I5JFG, WA5SOG. 450 WB8ZRL, W1HSP. 500 K5GOE. 600 N3RL, KL7AF, I2MQP. 650 IT9HLO. 700 WB8AAX. 750 HI8MOG, W1CNU. 800 SM3EVR. 850 K9BG, YU1OBA, W2MP. 1000 DJ4XA. 1150 DL1MD, K4IEX. 1250 I8KDB, KE4I. 1550 W2NC, N4MM, ON4QX.
SSB: 300 TF3CW, K0RDJ, JR3LGB, I5EFO, KB8JF, WB8ERL, JA1EN, AF5M, K5GOE. 400 I6COC, WA4NQG, WA4OIB. 500 N3RL, K9HDZ, K4IEX. 550 SM5CSS. 600 I2MQP. 700 CX9CO, W2MP. 750 DJ4XA. 800 W2NC. 1000 DL1MD. 1100 HP1JC. 1150 KrUR. 1350 N4MM.
CW: 300 EA1JO, VO2CW, AA4AK, SM6BBX, W1HSP, WB3DCT, HA5LZ, HA8UB. 350 N3RL. 400 SM5VB, SM5AKS. 450 CO2OM, JA7FFN/1. 500 I2DMK. 550 N5QQ, SP1ADM. 600 WB8AAX, W1WLW, VE3HLC, N4YB. 650 HP1AC, G3HB. 700 DL1MD, W1OPJ. 750 DJ4XA, SM0GMG. 1200 N6JV. 1450 ON5QX.
10 meters: HI8MOG, K5GOE.
15 meters: SM5CSS, N4YB.
20 meters: JR6CWC, JA7FFN/1, SM5CSS, KL7AF.
40 meters: HI8MOG, DJ4XA.
80 meters: DJ4XA, KL7AF, SM5CSS.
160 meters: JA7FFN/1.
Africa: DJ4XA, W1WLW.
Asia: HI8MOG, SM5CSS, SP6FER, I2MQP.
Europe: JA7FFN/1, JA6PWN, WB2FFY, SM5CSS.
No. America: DJ4XA, W1WLW, I2DMK.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to "CQ WPX Awards", 5014 Mindora Dr., Torrance, CA 90505. U.S.A.

From The Pileup

Those American Pacific Islands aren't so rare if you look, reports Bob, W6RCR. I worked a portable WH8 and a WH8 on Somoa recently. I heard a AH2 portable from the Baker-Howland area. (W6RCR) I will be operating from Port Royal, Jamaica during the *CQ* WWCW test as N0TG/6Y5. I'll be on through 3 December. N0WL will also be with me as N0WL/6Y5 but running s.s.b. only. I'll be on both modes from 23 November. QSLs being donated by the Northern California DX Foundation. (N0TG) CK2CRS is the official radio station for the Canoe Kaejak World Championship. (VE2CRS) Sure would like to be a QSL manager for a DX station. (KA8CWR) Several former active amateurs are memebers of the newly formed "Association of Radio Sport of the People's Republic of China". There is some specualation that some activity may come late this year. A Japanese report says an Icom IC-701 has been sent to the vice director of Peking's Scientific Club. The rig is to be tested and there are rumors it may even be operated by members of the club. (*IARU*) The rumors are still flying around about Burma. Especially the one about the European who was listening to the amateur bands in downtown Rangoon when his S-meter was suddenly pinned by a station signing XZ2BT. We have no idea what was going on but one can always hope. In the meantime, Dr. George Collins, VE3FXT is headed to Thailand this fall and will be out on the border doing some work. He has

Ken Chivertors, VK4VC, Nambour, Australia is an avid DXer on all bands. Ken worked W6XJ recently on 6 meters and then set a new 2 meter record from Queensland to New Zealand with ZL2BFC, a distance of 2,576 kilometers. Ken is also available on the lower bands where he is chasing those elusive ones for the Honor Roll.

got permission to operate from HS and promises to be active /XZ2. (*Long Skip*) KH0AA on Saipan is real. KH0AB just got his license and new call. (KG6SW)

Indian Ocean/Africa

Dave Schoen, N2KK, and Scotty Meadows, K5CO, plan an extensive series of operations in the Indian Ocean and Africa areas starting this year and running for about three months. They won't both be together for all the trip but will co-operate on the big ones.

Dave will be leaving the states in mid-November and aims to be at J28 Djibouti for the *CQ* World Wide DX contest. Then onto Reunion FR7 to start the Indian Ocean efforts.

He expects to be in Reunion about the first of December. This stop is to arrange transportation to other areas. Initial plans are for some Mauritius, 3B8; St. Brandon, 3B7; and Rodriquez, 3B9 operating. He will also be looking at operations from Mayotte, FH; D6; Glorioso and Juan de Nova. There will also be checking on possible operations on the East Africa area, especially some of the countries where the activity has been scant of late.

Dave is a professional photographer who has an assignment to do photography for some tourism promotion for some of the Indian Ocean Islands. You might check the bands while he is operating for information on changes in plans.

Latest rumors indicate there maybe an excellent chance for Dave to activate two that most of us need; Southern Yemen, 70 and Kamaran, VS9K. So keep your fingers crossed and your ears tuned.

73, Rod, W7OM

CQ DX Honor Roll

The *CQ* DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more countries for the mode indicated. The top SSTV DXers are also listed. The ARRL DXCC Country List, LESS DELETED COUNTRIES, is used as the country standard. Total numbers of countries currently on the DXCC list as of this listing is 319. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be submitted at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement.

C.W.

W6PT 319	N4PN 313	K6JG 307	N6CW 300	WA8DXA 290
ON4QX 317	W9DWQ 310	W2GT 305	N6FX 299	DJ7CX 288
K6EC 316	W8KPL 309	W4BQY 304	DL3RK 295	JA1GTF 287
W6ID 314	N6AV 308	K9MM 300	K4CEB 293	W4OEL 275

S.S.B.

WA2RAU 319	VE3MR 316	VE2WY 311	WB6DXU 302	WA4WTG 290
DL9OH 318	W9KRU 316	VE3GMT 311	DL6KG 301	VE7HP 289
I0AMU 318	F9RM 315	W9QLD 311	HP1JC 301	JH1VRQ 288
W2TP 318	I8AA 315	DJ9ZB 310	I5WT 300	I6PLN 287
TI2HP 318	I8YRK 315	I4ZSQ 310	N6AV 300	JA1GTF 287
W9DWQ 310	WA2EOQ 315	K9LKA 310	W8ILC 300	N6AW 287
W4EEE 318	K6WR 315	W4UG 310	W9SS 300	WA4JTI 287
W6EUF 318	SM6CKS 315	ZS6LW 310	OE3WWB 297	OK1MP 286
K2FL 317	VE3MJ 315	YV1KZ 309	KJ7CX 296	W7OM 286
K8DYZ 317	G3FKM 314	ZL1AGO 309	F9MS 295	YS1O 286
W3CWG 317	ZL3NS 314	F2MO 308	K8LJG 295	VE3FJE 285
W3AZD 317	EA4LH 313	K5OVC 307	W9DQ 295	I3LLD 283
W4UG 317	K6JG 313	XE1KS 307	K8PYD 294	K1UO 283
XE1AE 317	K6EC 312	W0SD 306	N2SS 294	K5DUT 279
K4MQG 316	N4WF 312	N4MM 305	W6FET 294	JA6GDG 277
I8KDB 316	W4DPS 312	W3GG 305	LU1BAR/W3 293	AA4A 276
K6YRA 316	W6RKP 312	VE7WJ 304	K4LSP 292	DJ2AA 276
W3NKM 316	I0ZV 311	DK2BL 303	K9RF 291	K9PPY 276
W4SSU 316	K9MM 311	K6XP 302	9H4G 291	W2CC 275
W9JT 316	OE2EGL 311	W0SFU 302	VE7CE 290	W0SR 275

SSTV

W8YEK 108	G3IAD 101

QSL Information

Thanks to Long Skip and The QSLer for the following:

A2CBW to DK3KD
A35BD ZL1BD
AI5P/C6A to W3HNK
AI5P/VP5 to W3HNK
C5ABX to K6MEP
C5ABZ to K6MEP
C31FS to EA3QS
CK2CRS to VE2FIT
CN8AD to F8JA
CO8RA to KA8BAC
CP8EV to WD4HKK
CT2BB to W1EP
CT2QN to W2KF
DA1WA/HB0 to DJ0LC
DU6RH to W7HPI
F6DCQ/HB0 to F6DCQ
F0FCU/FC to I3GNX
FB8XV to F5VU
FB8XW to F5VU
FG0DDV/FS to W2QM
FP0KH to W2KHQ
FP0OO to K1TOL
FP0PV to WA2PVV
HB0AFI to HB9MM
HB0AYX to HB9MM
HB0BOI to HB9MM
HC8GI to W3HNK
HD1A to WA4QMQ
HH2BM to W7RQ
HL9TF to WA4TTK
HM1QD to W7RQ
IG9BVS to I2BVS
IG9DMK to I2DMK
J3ABP to K5KG
J3ABQ to W5SJS
JA7JT/JD1 to JH7BRG
KA1MI to WB1GXU
KG6JIQ to W3HNK
KH6LW/KH7 to KH6JEB
KP2A to WB2VFT
KZ5GH to WB2DCP
N5RM/KC6 to N5RM
N0TG/6Y5 to N0TG
N0WL/6Y5 to N0TG
OD5ML to WA2RPN
OE6XG/a to WA3HUP
OH2BOZ/OH0 to OH2BOZ
OH2PQ/OH0 to OH2PQ
OK3TAB/D2A to OK3ALE
OX3CO to WB3KGY
P29JA to WA7OPZ
P29JS to F6CYL
P29PN to VK3BIF
PZ1CZ to WA5BYG
S2BTF to N0RR
SM0AGD/XW8 to SM3CXS
SX0AA/5 to K5VT
TA2KS to G3SCP
TI5EWL to WB1DGD
TJ1BB to WA1WLA
TK5ITU to F5IN
TK6ITU to F6BFG
TU2FH to F0BLK
UA0CCW to W7PHO
VE1AIH/1 to VE1AIH
VE6CKS/SU to VE6CKS
VK7AE to W5ACE
VK8TD to W6MSG
VK0AB to VK2BRN
VK0PK to VK3OT
VO1LX/4U to VE3IWI
VP2DAY to WA4DWN
VP2DXA to WB8LDH
VP2DXB to WB8LDH
VP2DXC to WB8LDH
VP2DXD to WB8LDH
VP2MBB to WB8LDH
VP2MDA to WB8LDH
VP2MDH to WB8LDH
VP2MEH to K8DD
VP2MFA to KA8AMX
VP2MFE to AC8W
VP2MUZ to WB8LDH
VP2VEN to K5GOE
VP2VEZ to W5HF
VP2VFC to VE1ASJ
VP5PX to W3HNK
VP8QE to K8FU
VQ9IN to W4XQ
VQ9JJ to W5RU
WQ9MR to N5GU
VQ9TC to W3HNK
VR1BD to W5RBO
VR1BE to W5RBO
VR1BE/KH1 to N6ADI
VR1BH to K4WSB
VR3AR to W7OK
VR6DX to W0PAH
VS6DO to K4CIA
W1LJ/OH0 to W1CKA
WA4YVG/KH2 to W4XQ
WA4YVG/VQ9 to W4XQ
WA6EWI/TI9 to W6WX
WH2ABB to WB5MAH
XT2AW to KN1DPS
YJ8DX to W0PAH
YJ8OT to VK3OT
YN1Z to K4CLA
ZB2EO to K3MNW
ZB2EY to DL5NJ
ZF2CN to WB4AXN
ZK1BD to ZL1SZ
ZL5MC to ZL2HE
3B6CD to 3B8CD
5N0SID to G4CTQ
5N0DOG to W4FRU
5W1BV to W0PAH
5Z4PD to DK3WL
8P6GN to WB4RRK
9H1ED to WA1YYX
9H1FN to WA1YYX
9K2EW to WA3SWH
9N1MMto N7EB
9Q5MA to K1VSK
9V1TK to JA6RIL
9V1TX to N5FN
A6XJA - Box 2526, Dubai, UAE or via I8YCP
AZ8CW - Box 10124, Washington, D.C. 20018
C21AM - Box 59, Nauru or via WA6AHF
C21MF - Box 162, Nauru
DA2QE - R L Chilcote, USAFSB Berlin Box 15, APO NY—09742

Hugh Carmichael, GI6VU, recently was awarded the CQ DX Award for his DX accomplishments. Hugh likes the high bands and can be found regularly working his two friends W8SJS and K8ZWH. He has WAS on 10 s.s.b. along with many other DX awards. He works all the bands and is happy to confirm Northern Ireland for the asking.

a monthly feature by

FRANK ANZALONE, W1WY

Contest Calendar

News/views of on-the-air competition

If you were planning to participate in the RSGB 7 MHz contests, forget it, the 1979 contests have been cancelled and are being scheduled for a still undecided date in February next year. The dates as listed in last month's Calendar were taken from an official announcement in the May issue of the RSGB magazine. The June issue had the cancellation, no advanced warning given.

Now for some corrections in the 1978 WW Phone results in the September issue. (Page 54, Trophy winners)

1. The call of the African all band winner is EA0CR, not EA8CR as shown.

2. The USA 3.8 MHz winner is N2KK/6, in case you are trying to figure out the /G.

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

*	Nov. 1-2	YLRL Anniv. C.W. Party
	Nov. 3-4	ARRL C.W. Sweepstakes
	Nov. 3-4	Oceania/Asia RTTY Con.
	Nov. 10-11	Int. Police Assoc. Party
	Nov. 10-11	Deleware QSO Party
†	Nov. 10-11	European RTTY Contest
	Nov. 11	Czechoslovakian Con.
	Nov. 17-18	ARRL Ph. Sweepstakes
	Nov. 17-18	Austrian 160 Meter Con.
	Nov. 24-25	**CQ WW DX C.W. Con.**
	Dec. 1-2	Spanish Phone Contest
	Dec. 1-3	Connecticut QSO Party
	Dec. 1-3	North Car. QSO Party
	Dec. 1-3	ARRL 160 Meter Contest
	Dec. 8-9	Spanish C.W. Contest
	Dec. 8-9	ARRL 10 Meter Contest
	Dec. 8-9	Hungarian Contest
	Dec. 22-23	Teenage QSO Party

* Covered last month
† Not official

This was the scene at super station N2AA in last year's CQ World Wide DX Contest, and it's being repeated in this year's contest. Having won the U.S. Multi-Multi Championship, both phone and c.w. last year they are out to defend their title. Shown in the photo are the five main operating positions, Drake TR-7s and Alpha finals, 10 thru 80. The 160 and auxilary positions are also in the same room. It would take more than Orr's Column to cover the antenna farm.

3. We overlooked the fact that YV2AMM had won the South American single band Trophy last year, which of course made Sergio ineligible for this year's award. The award therefore goes to Pablo Echevarria, CX7AL the runner-up.

The top scorer is not necessarily the Trophy winner. The 3 year eligibility clause must be taken into consideration, and if a station is already a world winner it does not seem proper that he should also pick up the Trophy for the sub-area in the same catagory. I feel that should go to the runner-up.

The C.W. results in the October issue also have a few corrections in the Trophy winners list.

1. The Carib./C.A. all band award is donated by Jim Neiger, N6TJ, not Mort Grotenstein, N6JT.

2. All African Trophy awards are reserved for residents only. The CT3BZ operation was made by OH2BH and Marty is not a resident of Madiera. Next in line is ZS6WW but Oliver picked up the marbles in 1977, therefore the evential winner is Rafael Herandez, EA8FO. (Anyway Marty has won his quota of Trophies for this year's contest.)

3. Since Jorge, LU8DQ is the winner of the World single band Trophy we think the South American award should go to the runner-up Ron Delcourt, FY7BC on 28 MHz. (I'm sure Rafael, CX3BR the donor will agree.)

4. The QRPp winner was inadvertingly ommitted. The winner of the Gene Walsh, N2AA plaque is Paul Wyse, OA8V who is making a collection of QRPp awards.

Hopefully that covers all the corrections except the few typos that always show up.

Now, over to the rules announcement, September issue, pages 47. You will note there is no sponsor for the Single Operator Contest Expedition Award. That spot has now been filled by the Yankee Clipper Club of the Northeastern area of the USA. A club to be reckoned with, 3rd high in this past contest.

Be sure to read John Attaway's

MY COMPETITION KNOWS ME . . . YOU SHOULD TOO!!!

Summer Special

HAL/79 Clock Kit **FREE** with every Counter

COMPLETE KITS: CONSISTING OF EVERY ESSENTIAL PART NEEDED TO MAKE YOUR COUNTER COMPLETE. **HAL-600A** 7-DIGIT COUNTER WITH FREQUENCY RANGE OF ZERO TO 600 MHz. FEATURES TWO INPUTS: ONE FOR LOW FREQUENCY AND ONE FOR HIGH FREQUENCY; AUTOMATIC ZERO SUPPRESSION. TIME BASE IS 1.0 SEC OR .1 SEC GATE WITH OPTIONAL 10 SEC GATE AVAILABLE. ACCURACY ±.001%, UTILIZES 10-MHz CRYSTAL 5 PPM. **COMPLETE KIT** ..... ~~$149~~ **$129**

HAL-300A 7-DIGIT COUNTER WITH FREQUENCY RANGE OF ZERO TO 300 MHz. FEATURES TWO INPUTS: ONE FOR LOW FREQUENCY AND ONE FOR HIGH FREQUENCY; AUTOMATIC ZERO SUPPRESSION. TIME BASE IS 1.0 SEC OR .1 SEC GATE WITH OPTIONAL 10 SEC GATE AVAILABLE. ACCURACY ±.001%, UTILIZES 10-MHz CRYSTAL 5 PPM. **COMPLETE KIT** ... ~~$124~~ ... **$109**

HAL-50A 8-DIGIT COUNTER WITH FREQUENCY RANGE OF ZERO TO 50 MHz OR BETTER. AUTOMATIC DECIMAL POINT, ZERO SUPPRESSION UPON DEMAND. FEATURES TWO INPUTS: ONE FOR LOW FREQUENCY INPUT, AND ONE ON PANEL FOR USE WITH ANY INTERNALLY MOUNTED HALTRONIX PRE-SCALER FOR WHICH PROVISIONS HAVE ALREADY BEEN MADE. 1.0 SEC AND .1 SEC TIME GATES. ACCURACY ±.001%. UTILIZES 10-MHz CRYSTAL 5 PPM. **COMPLETE KIT** ..... ~~$124~~ **$109**

PRE-SCALER KITS

HAL 300 PRE **$14.95**
(Pre-drilled G10 board and all components)

HAL 300 A/PRE **$24.95**
(Same as above with preamp)

HAL 600 PRE **$29.95**
(Pre-drilled G10 board and all components)

HAL 600 A/PRE **$39.95**
(Same as above but with preamp)

TOUCH TONE DECODER KIT

HIGHLY STABLE DECODER KIT. COMES WITH 2 SIDED, PLATED THRU AND SOLDER FLOWED G-10 PC BOARD, 7-567's, 2-7402, AND ALL ELECTRONIC COMPONENTS. BOARD MEASURES 3½ x 5½ INCHES. HAS 12 LINES OUT. ONLY **$39.95**

DELUXE 12-BUTTON TOUCHTONE ENCODER KIT utilizing the new ICM 7206 chip. Provides both VISUAL AND AUDIO indications! Comes with its own two-tone anodized aluminum cabinet. Measures only 2 3/4 × 3 3/4". Complete with Touch-Tone pad, board, crystal, chip and all necessary components to finish the kit.
PRICED AT **$29.95**

For those who wish to mount the encoder in a hand-held unit, the PC board measures only 9/16" × 1 3/4". This partial kit with PC board, crystal, chip and components.
PRICED AT **$14.95**

ACCUKEYER (KIT) THIS ACCUKEYER IS A REVISED VERSION OF THE VERY POPULAR WB4VVF ACCUKEYER ORIGINALLY DESCRIBED BY JAMES GARRETT, IN QST MAGAZINE AND THE 1975 RADIO AMATEURS HANDBOOK. **$16.95**

ACCUKEYER—MEMORY OPTION KIT THIS ACCUKEYER MEMORY KIT PROVIDES A SIMPLE, LOW COST METHOD OF ADDING MEMORY CAPABILITY TO THE WB4VVF ACCUKEYER. WHILE DESIGNED FOR DIRECT ATTACHMENT TO THE ABOVE ACCUKEYER, IT CAN ALSO BE ATTACHED TO ANY STANDARD ACCUKEYER BOARD WITH LITTLE DIFFICULTY. **$16.95**

6-DIGIT CLOCK • 12/24 HOUR

COMPLETE KIT CONSISTING OF 2 PC G10 PRE-DRILLED PC BOARDS, 1 CLOCK CHIP, 6 FND 359 READOUTS, 13 TRANSISTORS, 3 CAPS, 9 RESISTORS, 5 DIODES, 3 PUSH-BUTTON SWITCHES, POWER TRANSFORMER AND INSTRUCTIONS.
DON'T BE FOOLED BY PARTIAL KITS WHERE YOU HAVE TO BUY EVERYTHING EXTRA.
PRICED AT **$12.95**

CLOCK CASE Available and will fit any one of the above clocks. Regular Price . . . $6.50 **But Only $4.50 when bought with clock**

SIX-DIGIT ALARM CLOCK KIT for home, camper, RV, or field-day use. Operates on 12-volt AC or DC, and has its own 60-Hz time base on the board. Complete with all electronic components and two-piece, pre-drilled PC boards. Board size 4" x 3". Complete with speaker and switches. If operated on DC, there is nothing more to buy.*
PRICED AT **$16.95**
Twelve-volt AC line cord for those who wish to operate the clock from 110-volt AC. $2.50
*Fits clock case advertised below.

SHIPPING INFORMATION
ORDERS OVER $15.00 WILL BE SHIPPED POSTPAID EXCEPT ON ITEMS WHERE ADDITIONAL CHARGES ARE REQUESTED. ON ORDERS LESS THAN $15.00 PLEASE INCLUDE ADDITIONAL $1.00 FOR HANDLING AND MAILING CHARGES. SEND SASE FOR FREE FLYER.

HAL-TRONIX ✓H24

P. O. BOX 1101
SOUTHGATE, MICH. 48195
PHONE (313) 285-1782

master charge VISA

"HAL" HAROLD C. NOWLAND
W8ZXH

CIRCLE 21 ON READER SERVICE CARD

"CALL FOR QUOTE"

KENWOOD TS-520SE

MADISON ELECTRONICS SUPPLY, INC.

1508 McKinney • Houston, TX 77002
(713) 658-0268
MASTERCHARGE • VISA

CIRCLE 28 ON READER SERVICE CARD

State of the art
TECHNICAL EXCELLENCE
in RTTY

The FSK-1000™ Demodulator

If you demand the finest, no compromise technology, you need the FSK-1000 demodulator. Can't be outcopied because its design, computer grade parts, and modern technology offer landline copy over radio circuits.

Stops QRM with selectable 55 or 100 Hz. filters and two tone limiterless operation

Decision level correction improves selective fading

Uses either 170 volt, 60 Ma. or RS-232 loops

Video operation available. Interfaces microcomputers. We can install your Xitex SCT-100 board inside, too

Continuously adjustable shift from 100 to 1000 Hz.

Write for details. Visa and Master Charge accepted.

$449.00
FOB Columbus, Ohio

Dealer Inquiries Welcome

IRL™
700 Taylor Road
Columbus, Ohio 43230
(614) 864-2464

K4IIF DX Column for announcements of Contest Expeditions in both the Phone and c.w. contests.

And a final reminder, you will find complete rules for this year's World Wide Contest on pages 46/47 of the September issue. Closing mailing date for your Phone entry is December 1st, and January 15th if it's a C.W. entry. And please be sure to indicate on the envelope whether the content is a Phone or C.W. entry. And above all, do not include any other material in your contest envelope. The envelopes are not opened at the *CQ* office but by the Contest Directors weeks later.

Good luck. 73 for now, Frank, W1WY

ARRL Sweepstakes

C.W.: Nov. 3-5 Phone: Nov. 17-19
Starts: 2100 GMT Saturday
Ends: 0300 GMT Monday

Activity in this one is confined to stations in ARRL sections but they sure "tear up the pea patch," especially on the c.w. weekend.

In order to minimize QRM to non-contesters it is recommended that operation be confined to certain portions of the bands. This is outlined in *QST* and it is recommended that you check *QST* for this.

Operating time is limited to 24 out of the 30 hour contest period. And cross-check sheets are required if you make 200 or more contacts.

There are several more other operating regulations therefore it is recommended that you send for the "SS pakage" which includes log and summary sheets and Operating Aid No. 6. A large s.a.s.e. (28¢ postage) will get you enough forms for an average outing.

Requests and logs go to: ARRL Communications Dept., 225 Main Street, Newington, CT 06111

Oceania/Asia RTTY Contest

Sat. November 3 and
Sun. November 4
0800 to 1800 GMT both days.

This is the 1st of a series of three Flash RTTY contests organized by I.A.T.G. Radiocommunications.

I tried to cut the instructions down to size but Prof. Fanti outdid himself on this one. Briefly they are as follows:

Use all bands 3.5 thru 28 MHz. There are 3 classes, single operator, multi-operator and s.w.l.

Exchange: Signal report, QSO no. and your continent.

Points: QSOs on 80 and 40, 1 point. On 20, 2 points. On 15, 8 points. And 12 points on 10 meters.

Multiplier: Are given for countries and continents. Each country worked on 14, 21 and 28 MHz. However *no multipler* credit for 3.5 and 7 MHz contacts.

Contacts with Europe and Africa are worth 100 multiplier points. Other continents 50 points.

An additional 100 bonus points for each contact with Oceania and/or Asia on 21 or 28 MHz.

Final Score: Total QSO points × total countries worked × total continent points + Oceania/Asia bonus points.

The same station may be worked on each band for QSO points. Each call area in VE/VO, W/K, VK, PY, LU, JA, UA9/0 will be considered as a separate multiplier.

Beside the usual awards for the top stations, the winners will also be awarded points according to their position that will determine their final standing at the end of the three contest series. (Additional contests will be held in January and March.)

Better write to the good Professor for full details.

Your entry for this one must be received before December 15th and they go to: Prof. Franco Fanti, Via A. Dallolio n 19, 40139 Bologna, Italy

CUSTOM-MADE 8-POLE CRYSTAL FILTERS
GET THE BEST FOR LESS. IMPROVE YOUR RIG — OLD OR NEW
NO SET IS BETTER THAN ITS FILTER!

CW FILTERS – $55 EACH

250 and 500 Hz for YAESU
*FT-101 (through F); *FR-101; FT-7/B; *FT-301; *FT-101Z/D; FT-901 (all); FTdx560/570/401/B; FT-200 (Tempo I).

250 and 400 Hz for KENWOOD
*TS-520/S; *R-599; *TS-820/S; *R-820/S

NEW 250 Hz for COLLINS
75S-3B/C . . . $150 each

250 and 400 Hz for HEATH

SSB FILTERS – $55 EACH

1.8 and 2.4 kHz for YAESU
*FT-101 (through F); *FR-101; *FT-301; FT-7/B

1.8 kHz (only) for YAESU
FTdx560/570/401/B; *FT-101Z/D; FT-901; FT-200 (Tempo I)

1.8 kHz (only) for KENWOOD
*TS-520/S; *R-599; *TS-820/S; *R-820/S

1.8 and 2.1 kHz for HEATH
All models except SB-104

*Diode Switching Boards Available.

AM FILTERS – $55 EACH

6.0 kHz for YAESU (only)
*FT-101 (through F), *FR-101
(Others available shortly)

SPECIAL FOR DRAKE R-4B/C

GUF-1. Broad First IF Filter. Far Superior to original unit for CW/SSB. Choice of 6 or 8 kHz Bandwidth. $65.

GUF-2. Narrow First IF Filter for Superior CW. PCB assembly with Filter, Relays, etc. Permits automatic selection of broad or narrow filter. Choice of 600 or 800 Bandwidth. Easy installation. $90.

YF56H125. Extremely sharp (125 Hz B.W.) CW Second IF Filter for DX and Contesters. Plugs into back apron of set. $90.

GUD. Product Detector mini-board converts existing detector to superior double-balanced type. Fully wired, easy installation. $30.

*DIODE SWITCHING BOARDS

These permit the addition of one or two filters more than those for which room is normally provided. With complete instructions — no drilling.

For YAESU and KENWOOD Only
Single type (one filter). $12
Dual type (two filters). $21

Reduce QRM with FOX-TANGO's superb quality crystal filters. Custom-made for each rig, installation is a breeze — just drop the filter into existing holes. When ordering, state **make** of rig, **model, filter type,** and **bandwidth** desired. Prices include airmail postpaid to U.S., Canada, and Mexico. For overseas insured airmail add $5 for crystal filters, $2 for diode switching boards. Satisfaction guaranteed or money back. Dealer inquiries invited.

FOX-TANGO CORP.
Box 15944Q, West Palm Beach, FL 33406

FLORIDA RESIDENTS, ADD 4% SALES TAX

CIRCLE 18 ON READER SERVICE CARD

omni-j

ANTENNAS

Model OJA-146

TWO METER AMATEUR BAND 146-148MHz

- NO GROUND PLANE REQUIRED
- USE FIXED, MOBILE, OR PORTABLE
- 5dB GAIN OVER ISOTROPIC IN MOST MOBILE APPLICATIONS
- OVERALL LENGTH: LESS THAN 64 INCHES
- COLLAPSIBLE TO 22 INCHES. MAY BE PACKED IN SUITCASE FOR THOSE OUT-OF-TOWN TRIPS
- STEEL WHIP AND ADAPTER INCLUDED FOR MOBILE AND FIXED APPLICATIONS
- VSWR: LESS THAN 1.2:1

PRICE $39.95 UPS Prepaid
220 MHz — $37.95 450 MHz — $37.95

MADISON
Electronics Supply, Inc.
1508 McKinney • Houston, Texas 77002 • (713) 658-0268

CIRCLE 27 ON READER SERVICE CARD

Int. Police Assoc. Contest
Sat. Nov. 10 and Sun. Nov. 11
0800 - 1000, 1400 -1700, 1800 - 2000 GMT each day.

This contest has been organized by the International Police Assoc. Radio Club (French Section) to enable participants to get credit for the Sherlock Holmes Award. It's open to all, non-members as well as members, and s.w.l.s too.

Exchange: RS(T) and QSO number. Members will identify by sending IPA before their report (IPA 57(9)001)

Scoring: Contacts on 80 and 40 count 2 points, and 4 points on 20, 15 and 10.

Multiplier: Number of IPA countries worked on each band determines the multiplier. An IPA country is only counted if an IPA station has been worked in that country. The same station may be worked once on each band for QSO and multiplier credit.

Final Score: Total QSO points from all bands times the sum of the multiplier from each band.

Frequencies: CW - 3575, 7025, 14075, 21075, 28075. SSB - 3650, 7075, 14295, 21295, 28650.

Certificates to the top three scorers and credits for other awards.

A large s.a.s.e. (2 stamps or 2 IRCs) to Vince Gambino, WB4QJO, 7606 Kingsbury Road, Alexandria, VA 22310, will get you all the details and information about the Sherlock Holmes Award. Also log forms, membership list and etc.

Mailing deadline for logs is December 31st and go to: Bureau National I.P.A., Section Francaise, C.N.A.S., Att: Mr. Gerard Dupuis, 15 Rue Cambaceres, 75008 Paris, France

Delaware QSO Party
Starts: 1700 GMT Sat. November 10
Ends: 2300 GMT Sun. November 11

The Delaware A.R.C. has modified the scoring for non-DE stations but otherwise rules remain essentially the same for this year's party.

Stations may be worked once per band and per mode for QSO and multiplier credit.

Exchange: QSO no., RS(T) and QTH. County for DE stations, ARRL section or country for others.

Scoring: DE stations score 1 point per QSO. Multiply total by the number of ARRL sections and DX countries worked.

Others get 5 points for each DE station worked. Multiply total by the number of DE countries worked on each band and each mode. (max. of 36 multiplier possible) There are three DE countries, Kent, New Castle and Sussex.

Frequencies: CW - 1805, 3560, 7060, 14060, 21060, 28160. SSB - 1815, 3975, 7275, 14325, 21425, 28650. Novice -3710, 7120, 21120, 28160.

Appropriate awards will be given to the top scorers. In addition a certificate to all stations working all three Delaware counties.

Mailing deadline is December 31st to: Steve Momot, K3HBP, 14 Balsam Road, Wilmington, DE 19804

Eurpoean RTTY Contest
Starts: 0000 GMT Sat. November 10
Ends: 2400 GMT Sun. November 11

Rules for the RTTY contest are the same as the DARC WAE phone and c.w. contests held in August and September, and were covered in details in the August issue. Since they are quite lengthy they will not be repeated here.

There was one exception, in the RTTY contest contacts are also permitted between all continents as well as one's own continent, and count one point per QSO. They have no multiplier value however other than the countries as listed in the rules. (ARRL and DARC country list) QTC traffic exchange is allowed between

WHY PAY

FULL PRICE FOR AN 80-10 METER VERTICAL...

. . . if you can use only 1/3 of it on 10?
. . . or only 1/2 of it on 20?
. . . or only 3/4 of it on 40?

Only Butternut's new HF5V-III lets you use the entire 26-foot radiator on 80, 40, 20 and 10 meters (plus a full unloaded quarter-wavelength on 15) for higher radiation resistance, better efficiency and greater VSWR bandwidth than conventional multi-trap designs of comparable size.

The HF5V-III uses only two high - Q L-C circuits (not traps!) and one practically lossless linear decoupler for completely automatic and low VSWR resonance (typically below 1.5:1) on 80 through 10 meters, inclusive.

And for completely automatic operation on 160 through 10 meters, simply install the TBR-160 M unit at the base of the HF5V-III ! (What other vertical offers you a "top band" option plus simultaneous resonances on 80 through 10 meters?)

For further information, including complete specifications on the HF5V-III and other Butternut antenna products, ask for our latest free catalog. If you've already "gone vertical" and are happy with your present system, ask for one anyway - - there's a lot of information in it about vertical antennas in general, ground and radial systems, plus helpful tips on installing any vertical on rooftops, on mobile homes, etc.

Suggested Amateur Net: HF5V-III - - $98.00* (available 15 Oct.)
TBR-160 - - $34.50

*An export/DXpedition version suitable for surface parcel post shipment outside the USA - - or as "hand luggage" - - is available at a slight additional cost.

BUTTERNUT ELECTRONICS COMPANY
Route 1 Lake Crystal, Mn. 56055 Phone: (507) 947-3126

master charge VISA

all stations, but not between stations in the same continent. Everything else remains the same.

Mailing deadline for all entries is December 1st and they go to: WAEDC Contest Committee, P.O. Box 262, D-895 Kaufbeuren, West Germany.

Czechoslovakian Contest
0000 to 2400 GMT Sunday, November 11

This is a world-wide type contest so activity is not confined to working Czechs only.

All bands 1.8 thru 28 MHz, phone and c.w. The same station may be worked once on each band for QSO and multiplier credit. (On 160 the OKs are now permitted to use s.s.b., 1820 -1950, as well as c.w.) Cross-band or cross-mode contacts are not permitted however.

Classes: Single operator, both single and all band, and multi-operator all band only. Club stations considered multi-operator.

Exchange: RS(T) plus two figures indicating your ITU zone. (List and may available from C.R.C., send s.a.e. and 3 IRCs.)

Scoring: One point per QSO, 3 points if it's with a Czech station. Multiply total QSO points by the sum of ITU zones worked on each band for your final score. Own country may be worked for multiplier credit but not QSO points.

Awards: Certificates to the top scoring station in each class in each country. (The Czechs are looking for more stateside participation before making awards by districts.)

The "100 OK" and "S6S" awards are available for contest contacts upon written application with your contest entry.

Use a separate log for each band, include a summary sheet showing the scoring, and the usual signed declaration that all rules and regualtions have been observed.

Mailing deadline for all entries is December 31st to: The Central Radio Club, P.O. Box 69, 113 27 Praha 1, Czechoslovakia

Austrian 160 C.W. Contest
Starts: 1900 GMT Sat., November 17
Ends: 0600 GMT Sun., November 18

Not much has been heard about this Top Band contest since the activity is geared for the Europeans, however it is possible to work the OE's and other Europeans under favorable conditions.

Exchange: RST plus a progressive QSO number starting with 001.

Scoring: Each completed QSO counts 1 point. Score a multiplier of 1 for each different country/numeral prefix worked, 2 multiplier points if it's an OE prefix. (OE1-OE9) Final score, total QSOs times the sum of multiplier points.

Freqencies: Austrian stations are authorized to use 1823 - 1838, 1854 -1873, 1879 - 1900 kHz. Others according to freqeuncies authorized in their country.

There is also a s.w.l. division with scoring same as above.

Awards: Certificate and pennant to top scorer in each country. A Trophy to top score in the contest, and certificates and pennants to the 2nd thru 5th places. There are also awards for SWL's. All participants will receive results of the contest.

A summary sheet and the usual signed declaration is also required.

Mailing deadline is December 15th to: Osterreichischer Versuchssenderverband, OVSV "AOEC 1979" Att: Mr. Fritz Schlommer. OE6SFG, Klaus 131, A-8970 Schladming, Austria

STEP UP TO TELREX

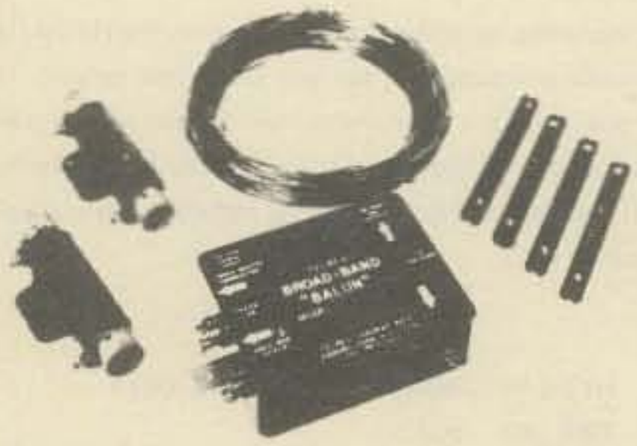
WITH A

TELREX "BALUN" FED—"INVERTED-VEE" KIT

THE IDEAL HI-PERFORMANCE

INEXPENSIVE AND PRACTICAL TO INSTALL LOW-FREQUENCY

MONO OR MULTIPLE BAND, 52 OHM ANTENNA SYSTEM



Telrex "Monarch" (Trapped) I.V. Kit
Duo-Band / 4 KWP I.V. Kit $62.50
Post Paid Continental U.S.

Optimum, full-size doublet performance, independent of ground conditions!
"Balanced-Pattern", low radiation angle, high signal to noise, and signal to interferance ratio!
Minimal support costs, (existing tower, house, tree).
A technician can resonate a Telrex "Inverted-Vee" to frequency within the hour!
Minimal S/W/R is possible if installed and resonated to frequency as directed!
Pattern primarily low-angle, Omni-directional, approx. 6 DB null at ends!
Costly, lossy, antenna tuners not required!
Complete simplified installation and resonating to frequency instructions supplied with each kit.

For technical data and prices on complete Telrex line, write for Catalog PL 7

COMMUNICATION SYSTEMS SINCE 1921 Telrex Laboratories
ASBURY PARK, NEW JERSEY 07712 U.S.A.

CIRCLE 36 ON READER SERVICE CARD

Two Great New Circuit Values From:
DIGITREX
ELECTRONICS COMPANY

PA-19 Wideband Preamplifier

- 2 to 200 MHz Bandwidth (-3dB Points)
- 19dB Gain!
- 50 Ohms Input & Output Impedance
- Tiny PC Board Size (7/8" x 1-5/8")
- Absolutely No Tuning Required
- Extremely Stable
- Draws only 20MA @ 12VDC
- Great Way to Increase Sensitivity of Receivers, Counter, etc.
- Fully Assembled and Tested
- Instructions Provided, Full Warranty

only $8.95
+.50 Shipping/Handling

PS-600 600 MHz Prescaler

- Provides ÷10 and ÷100 TTL Level Output
- 75 MV RMS Input Sensitivity
- Built in 5 Volt Regulator Allows Use at 8-12 VDC @ 90-110 MA.
- Tiny PC Board Size (1-1/4" x 1-3/8")
- Fully Assembled and Tested
- Instructions Provided, Full Warranty

only $28.95 ppd

New PS-1250 1.25 GHz Prescaler

complete $79.95 ppd

COD Orders Accepted 7am-10pm
4412 Fernlee
Royal Oak, Michigan 48073
Phone 313-651-9247

CIRCLE 13 ON READER SERVICE CARD

NEW MFJ Deluxe Keyer has Speed Readout

Socket for external Curtis memory, random code generator, keyboard. Uses Curtis 8044 IC. Gives you dot-dash memories, weight, speed, volume, tone controls, speaker. Sends iambic, automatic, semi-automatic, manual. Reliable solid state keying, RF proof.

BRAND NEW

Speed Readout Meter lets you read to 50 WPM.
Socket for Curtis memory, random code generator, keyboard.

$79.95

The new MFJ-408 Deluxe Electronic Keyer II is based on the proven Curtis 8044 IC keyer chip. **Speed readout meter** lets you read sending speed to 50 WPM. **Socket** (optional cable with plug, $3.00) lets you use external Curtis memory, random code generator, keyboard (available from Curtis Electro Devices).

Sends iambic, automatic, semi-automatic, manual. Use squeeze, single lever or straight key.

Iambic operation with squeeze key. Dot-dash insertion. **Semi-automatic "bug" operation** provides automatic dots and manual dashes.

Dot-dash memory, self-completing dots and dashes, jam-proof spacing, instant start. **RF proof.**

Ultra-reliable solid-state keying: grid block, cathode, solid state transmitters (-300 V, 10 ma. max, +300 V, 100 ma. max).

All controls are on front panel: speed, weight, tone volume, function switch. Smooth linear speed control. 8 to 50 WPM.

Weight control adjusts dot-dash space ratio; makes your signal distinctive to penetrate QRM.

Tone control. Room filling volume. Built-in speaker. Ideal for classroom teaching.

Function switch selects off, on, semi-automatic/manual, tune. Tune keys transmitter for tuning.

Completely portable. Operates up to a year on 4 C-cells. 2.5 mm phone jack for external power (6 to 9 VDC). Optional AC adapter $7.95.

Eggshell white, walnut sides. 8x2x6 inches.

Stereo phone jack for key, phono jack outputs. **OPTIONAL BENCHER IAMBIC PADDLE.** Dot and dash paddles have fully adjustable tension and spacing. Heavy base with non-slip rubber feet eliminates "walking." $39.95.

Order from MFJ and try it — no obligation. If not delighted, return it within 30 days for refund (less shipping). One year unconditional guarantee.

Order today. Call toll free 800-647-1800. Charge VISA, MC or mail check, money order for $79.95 plus $3.00 shipping for MFJ-408 keyer and/or $39.95 plus $3.00 shipping for Bencher paddle.

CALL TOLL FREE . . . 800-647-1800
For technical information, order/repair status, in Miss., outside continental USA, call 601-323-5869.

MFJ ENTERPRISES, INC.
BOX 494, MISSISSIPPI STATE, MS 39762

CIRCLE 98 ON READER SERVICE CARD

NEW MFJ-624 Deluxe Hybrid Phone Patch

Feature Packed: VU meter for line level and null. Has receiver gain, transmitter gain, null controls, bypass switch. Beautiful hum-free audio. RF filtered. VOX or push-to-talk. Works with any rig. Simple patch-in-patch-out installation.

BRAND NEW

Crisp, clear hum-free audio is what phone patching is all about and MFJ has it.

$59.95

This new MFJ-624 Telepatch II hybrid phone patch gives you a combination of performance, features, and quality that you won't find in other phone patches.

PERFORMANCE: Gives you crisp clear, hum-free audio which is what phone patching is all about. Use automatic VOX or push-to-talk. RF pi-filters and PC board construction eliminates RF feedback. Works with any rig.

FEATURES: VU meter monitors telephone line level to prevent crosstalk between telephone channels. Also lets you adjust null depth for maximum isolation between receiver and transmitter.

Separate transmitter and receiver gain controls eliminate readjusting rig's controls after patching.

Null control for maximum isolation.

Function switch: OFF for normal operation. **ON** connects your rig to phone line for patching. **NULL** switches VU meter to let you adjust for maximum null.

Simple 2 cable installation (plus phone line) when rig has patch-in-patch-out jacks. Connects easily to **any** rig.

Phono jacks for patch-in-patch-out, speaker, microphone. Screw terminals for phone lines.

Eggshell white, walnut sides. 8x2x6 inches.

QUALITY: Every single unit is tested for performance and inspected for quality. Solid American construction, quality components.

MFJ-620 TELEPATCH HYBRID PHONE PATCH. Same as MFJ-624 but less VU meter. 6x2x6 inches. $49.95 plus $3.00 shipping and handling.

One year unconditional guarantee.

Order from MFJ and try it — no obligation. If not delighted, return it within 30 days for refund (less shipping).

Order today. Call toll free 800-647-1800. Charge VISA, MC or mail check, money order for $59.95 plus $3.00 shipping for MFJ-624 and $49.95 plus $3.00 shipping for MFJ-620.

CALL TOLL FREE . . . 800-647-1800
For technical information, order/repair status, in Miss., outside continental USA, call 601-323-5869.

MFJ ENTERPRISES, INC.
BOX 494, MISSISSIPPI STATE, MS 39762

CIRCLE 99 ON READER SERVICE CARD

a monthly feature by

GEORGE JACOBS, W3ASK

Propagation

The science of predicting radio conditions

The c.w. section of the 1979 *CQ* World Wide DX Contest will take place on the weekend of Nov. 24-25. Special *DX Propagation Charts* for the use during both the Phone and c.w.sections of the Contest appeared in last month's column, along with some valuable tips and suggestions for piling up points during the Contest. Be sure to refer to last month's column if you are planning to participate in the c.w. section of this year's Contest.

Peak In Solar Activity?

It will be several months before we know for sure, but there are several important signs that the present sunspot cycle may have reached its peak intensity this past September, and that solar activity is now slowly declining.

The Swiss Federal Solar Observatory at Zurich reports monthly mean sunspot numbers of 151 for June and 160 for July. These result in 12-month running smoothed numbers of 118 and 124 centered on December, 1978 and January, 1979 respectively. The Swiss Observatory forecast the present cycle to peak during Spetember, 1979 with a smoothed sunspot number of 153. This would make the present cycle the *third* most intense recorded in the more than 200 years that solar records have been kept.

A smoothed sunspot number of 151 is forecast for this month. This means that solar activity during the 1979 Contest period should be higher than during any Contest period since 1958, and higher than it will probably ever be again for several decades!

C.W. Contest Tips

During the daylight hours, from shortly after sunrise through sunset, look for excellent DX conditions on the *10, 15* and *20* meter bands.

From sundown to Midnight, best DX honors should be shared between the *20* and *40* meter bands, with some good openings possible to southerly and westerly directions on *15* meters. Also check the *80* and *160* meter bands during this time period.

From Midnight to sunrise, the best DX bands should be *40* and *80* meters, with good openings also possible on *20* meters towards southern and western areas. Also check for *160* meter DX during this period.

The following is a sample Work Chart for the c.w. contest section, devised from the *DX Propagation Charts* wihch appeared in last month's column. This particular example is for the *20* meter band, and for QTHs in the EST zone. Similar charts can be devised for other bands, for multi-band operation, and for other time zones.

11307 Clara St., Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for November 1979

	Expected Signal Quality			
Propagation Index	(4)	(3)	(2)	(1)
Above Normal: 16, 25	A	A	B	C
High Normal: 5-6, 13, 15, 19, 21, 24, 26	A	B	C	C-D
Low Normal: 4, 7, 11-12, 14, 17-18, 20, 23, 27, 30	A-B	B-C	C-D	D-E
Below Normal: 1, 3, 8, 10, 22, 28-29	B-C	C-D	D-E	E
Disturbed: 2, 9	C-E	D-E	E	E

Where expected signal quality is:

A—Excellent opening, exceptionally strong, steady signals greater than S9+30 dB.

B—Good opening, moderately strong signals varying between S9 and S9+30 dB, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S9, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, and with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find *propagation index* associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the *propagation index*, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a *propagation index* of 3 will be fair to poor (C-D) on Nov. 1st, poor to no opening (D-E) on the 2nd, fair to poor (C-D) on the 3rd, fair to good (C-B) on the fourth, etc. Conditions during the CQ WW DX Contest should be high normal on the 24th and above normal on the 25th.

For updated information, subscribe to bi-weekly MAIL-A-PROP, P.O. Box 1714, Silver Spring, MD 20902.

Sample Single Band Operating Plan 20 Meters- Eastern USA QTH

Time EST	Areas To Which Openings Can Be Expected
00-03	Far East, South Pacific & New Zealand, Australasia, Caribbean, Central & South America, Antarctica, Africa
03-06	Africa, South Pacific & New Zealand, Australasia, Caribbean, Central & South America
06-09	Europe, Central & South Asia, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean, Central & South America
09-12	Europe, Central & South Asia, Caribbean & Central America
12-15	Europe, Africa, Caribbean and Central America
15-18	Europe, Africa, Caribbean and Central America
18-21	Europe, Eastern Mediterranean, Middle East, Africa, Southeast Asia, Caribbean, Central & South America
21-00	Southern Europe, Eastern Mediterranean, Middle East, Africa, Central and South Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean, Central & South America, Antarctica

V.h.f. Openings

The big v.h.f. news this month should be the expected DX openings on *6* meters. Solar activity is now high enough to permit farily regular F-2 layer openings to many areas of the world on this band. Don't be surprised that if on a really good day it may be possible to work stations on all continents on *6* meters! Conditions should peak for openings towards Europe and in a generally easterly direction before Noon. Unfortunately, few countries in Europe permit amateur activity in this band, but what's on should make it across the

Barry Electronics Corp.

WE SHIP WORLDWIDE

WORLD WIDE AMATEUR RADIO SINCE 1950

Your one source for all Radio Equipment!

COLLINS 32-S-S

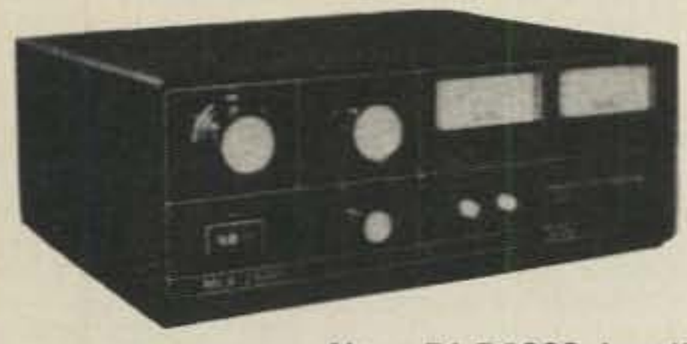
DRAKE

DRAKE TR-7 &
UV3 (144-220-440)

cushcraft and

Mosley Tri-band beams
10-15-20
TA-33, TA-33 Jr.
In Stock

BIRD
Wattmeters
in stock

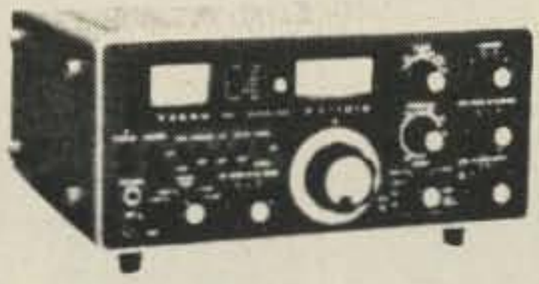


New: DLR2000 Amplifier
DENTRON MLA-2500 Amplifier &
MTA-3000 Tuners Clipperton "L"

DSI
500HH

TOWERS
Tri-Ex, Wilson
Unarco Rohn

Murch Model UT2000A,
UT2000B and UT2000A-LS



YAESU FT-101ZD
FT-901DM,
FT-227RA, FT-7B
FRG 7000
Also Available FT-207R

MIDLAND 13-509,
13-513 & 13-10

New York City's *LARGEST STOCKING HAM DEALER COMPLETE REPAIR LAB ON PREMISES–*

MAIL ALL ORDERS TO: BARRY ELECTRONICS CORP.
512 BROADWAY, NEW YORK CITY, NEW YORK 10012
BARRY INTERNATIONAL TELEX 12-7670 212-925-7000
TOP TRADES GIVEN ON YOUR USED EQUIPMENT

AUTHORIZED DISTS. MCKAY DYMEK
FOR SHORTWAVE RECEIVERS

NEW TOUCH TONE AUTO DIALER WITH MEMORY—MODEL AD-1, $117.95, BIRD WATTMETER, ROBOT, HY-GAIN, LARSEN, SHURE, KDK-2015R, TURNER, ASTATIC, MOSLEY, VHF ENG., TEN-TEC "OMNI-D", EDGECOM, KANTRONICS.
WE NOW STOCK THE MURCH ULTIMATE TRANSMATCH 2000B
DEALER INQUIRIES INVITED, PHONE IN YOUR ORDER & BE REIMBURSED.

CIRCLE 3 ON READER SERVICE CARD

Atlantic. Shortly after noon openings should pick up towards Africa, and continue swinging in a more southerly direction during the early afternoon hours. During the late afternoon hours start looking for openings more towards the southwest and west. Many of these expected *6* meter F-2 layer openings will be characterized by relatively strong signal levels.

Some TE-scatter type *6* meter openings should be possible during November, towards South America. Evenings between approximately 8 and 11 p.m., local standard time, are the best times to check for TE openings, and conditions favor the southern tier states. Peak seasonal conditions for TE openings have already passed, and openings this month should at best be erratic, with weak signal levels and considerable flutter-fading.

The short, but significant meteor showers should occur during November, making possible some meteor-scatter type openings on the v.h.f. bands. The *Taurids* shower, which should last for a day or two, is expected to reach peak intensity on November 4, with approximately 15 meteors entering the earth's atmosphere each hour. A second shower of about the same duration and intensity, called the Leonids, should peak at about 11 a.m. EST on November 17.

Some fairly intense auroral activity can occur during November, bringing with it conditions for auroral-type openings on the v.h.f. bands. Such activity is usually associated with periods of radio storminess, and is most likely to occur on those days shown as BELOW NORMAL or DISTURBED in the "Last Minute Forecast" appearing at the beginning of this column.

This month's column contains Short-Skip propagation data for use between distances of approximately 50 and 2300 miles, and between the states of Hawaii and Alaska and the Continental areas of the USA.

Gook luck in the c.w. section of the *CQ* World Wide DX Contest, and please let me know how the special Contest propagation forecasts work out.

73, George, W3ASK

CQ Short-Skip Propagation Charts
November & December, 1979
Local Standard Time at Path Mid-Point
(24-Hour Time System)

Band (Meters)	Distance From Transmitter (Miles)			
	50-250	250-750	750-1300	1300-2300
10	*Nil*	*Nil*	07-09 (0-1) 09-11 (0-2) 11-15 (0-3) 15-16 (0-2) 16-18 (0-1)	07-08 (1) 08-09 (1-2) 09-11 (2-3) 11-15 (3-4) 15-16 (2-4) 15-18 (1-4) 18-19 (0-3) 19-20 (0-2) 20-21 (0-1)
15	*Nil*	08-10 (0-1) 10-16 (0-3) 16-17 (0-2) 17-18 (0-1)	07-08 (0-1) 08-09 (1-3) 09-10 (1-4) 10-16 (3-4) 16-17 (2-4) 17-19 (1-4) 19-20 (0-3) 20-21 (0-1)	07-08 (1) 08-09 (3-2) 09-19 (4) 19-20 (3) 20-21 (1-2) 21-00 (0-1)
20	09-11 (0-1) 11-15 (1-2) 15-17 (0-1)	07-09 (0-2) 09-11 (1-4) 11-15 (2-4) 15-17 (1-4) 17-18 (0-4) 18-19 (0-3) 19-20 (0-2) 20-07 (0-1)	07-09 (2-3) 09-18 (4) 18-19 (3-4) 19-20 (2-4) 20-21 (1-4) 21-23 (1-3) 23-02 (1-2) 02-07 (1)	07-09 (3) 09-12 (4) 12-15 (4-3) 15-21 (4) 21-23 (3-4) 23-02 (2-3) 02-06 (1-2) 06-07 (1)
40	07-08 (0-2) 08-09 (1-3) 09-19 (4) 19-21 (2-3) 21-00 (1-2) 00-07 (0-1)	07-08 (2-4) 08-09 (3) 09-15 (4-3) 15-19 (4) 19-21 (3-4) 21-00 (2-4) 00-02 (1-3) 02-06 (1-2) 06-07 (1-3)	07-08 (4) 08-09 (3-2) 09-15 (3-1) 15-17 (4-2) 17-00 (4) 00-02 (3-4) 02-06 (2-4) 06-07 (3-4)	06-07 (4-3) 07-08 (4-2) 08-09 (2-1) 09-15 (1-0) 15-17 (2-0) 17-19 (4-3) 19-06 (4)
80	08-15 (4-3) 15-02 (4) 02-04 (3-4) 04-07 (2-3) 07-08 (3-4)	08-09 (3-2) 09-15 (3-1) 15-18 (4-3) 18-04 (4) 04-07 (3-4) 07-08 (4-3)	08-09 (2-1) 09-15 (1-0) 15-18 (3-1) 18-06 (4) 06-07 (4-3) 07-08 (3-1)	08-09 (1-0) 09-15 (0) 15-18 (1-0) 18-20 (4-1) 20-05 (4) 05-06 (4-3) 06-07 (3-1) 07-08 (1)
160	07-09 (3-2) 09-11 (2-0) 11-17 (1-0) 17-19 (3-2) 19-07 (4)	07-09 (2-1) 09-17 (0) 17-19 (2-1) 19-04 (4) 04-07 (3-2)	07-09 (1-0) 09-17 (0) 17-19 (1-0) 19-21 (4-2) 21-04 (4) 04-06 (2) 06-07 (2-1)	07-19 (0) 19-21 (2-1) 21-04 (4-3) 04-06 (2-1) 06-07 (1-0)

ALASKA
November & December, 1979
Openings Given In GMT#

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	17-18 (1) 18-20 (2) 20-22 (3) 22-00 (2) 00-01 (1)	15-16 (1) 16-17 (2) 17-21 (3) 21-23 (4) 23-00 (3) 00-01 (2)	12-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-02 (3) 02-03 (2) 03-05 (1)	06-12 (1) 07-11 (1)*
Central USA	17-18 (1) 18-20 (2) 20-00 (3) 00-01 (2) 01-02 (1)	15-16 (1) 16-17 (2) 17-20 (3) 20-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	12-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-03 (3) 03-04 (2) 04-06 (1)	06-08 (1) 08-13 (2) 13-14 (1) 07-12 (1)*
Western USA	18-19 (1) 19-20 (2) 20-21 (3) 21-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	16-17 (1) 17-18 (2) 18-20 (3) 20-01 (4) 01-02 (3) 02-03 (2) 03-04 (1)	12-16 (1) 16-18 (2) 18-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1)	02-03 (1) 03-05 (2) 05-14 (3) 14-15 (2) 15-16 (1) 04-06 (1)* 06-14 (2)* 14-16 (1)*

HAWAII
November & December, 1979
Openings Given In Hawaiian Standard Time

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	06-07 (1) 07-08 (2) 08-13 (4) 13-14 (3) 14-15 (2) 15-16 (1)	06-07 (1) 07-09 (4) 09-12 (3) 12-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	12-14 (2) 14-17 (4) 17-21 (3) 21-00 (2) 00-06 (1) 06-08 (3) 08-09 (2) 09-12 (1)	17-18 (1) 18-20 (2) 20-02 (3) 02-03 (2) 03-04 (1) 19-20 (1)* 20-01 (2)* 01-03 (1)*
Central USA	06-07 (1) 07-08 (3) 08-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (1) 07-09 (4) 09-13 (3) 13-17 (4) 17-19 (3) 19-20)2) 20-21 (1)	08-13 (2) 13-14 (3) 14-20 (4) 20-00 (3) 00-02 (2) 02-05 (1) 05-06 (2) 06-08 (3)	17-18 (1) 18-20 (2) 20-21 (3) 21-01 (4) 01-03 (3) 03-04 (2) 04-05 (1) 19-20 (1)* 20-22 (2)* 22-01 (3)* 01-03 (2)* 03-04 (1)*
Western USA	07-08 (1) 08-09 (2) 09-16 (4) 16-17 (3) 17-18 (2)* 18-19 (1)	06-07 (1) 07-08 (2) 08-12 (3) 12-18 (4) 18-20 (3) 20-21 (2) 21-22 (1)	08-10 (4) 10-15 (3) 15-22 (4) 22-01 (3) 01-04 (2) 04-06 (1) 06-08 (3)	17-18 (1) 18-19 (2) 19-20 (3) 20-03 (4) 03-05 (3) 05-06 (2) 06-07 (1) 19-20 (1)* 20-21 (2)* 21-04 (3)* 04-05 (2)* 05-06 (1)*

#See explanation in "How To Use Short-Skip Charts" in the box at the beginning of this column.

*Indicates best time to listen for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a forecast rating of (2), or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distance *greater* than 1300 miles. For openings over shorter distances, use the preceding Short-Skip Propagation Chart.

Check for 6 Meter openings at times when the 10 Meter forecast rating is shown as (4).

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular Meter band (10 through 160 Meters) as shown in the left hand column of the Chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate Meter band column (10 through 80 Meters) for a particular geographical region of the continental USA as shown in the left hand column of the Charts. An * indicates the best time to listen for 80 meter openings.

2. The *propagation index* is the number that appears in ( ) after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parenthesis, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of *days* during the month on which the opening is expected to take place, as follows:

(4) Opening should occur on more than 22 days
(3) " " " between 14 and 22 days
(2) " " " between 7 and 13 days
(1) " " " on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual *dates* on which an opening with a specific *propagation index* is likely to occur, and the signal quality that can be expected.

3). Times shown in the Charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. On the Short-Skip Chart appropriate *standard* time is used at the *path midpoint*. For example on a circuit between Maine and Florida, the time shown would be EST, on a circuit between N.Y. and Texas, the time at the midpoint would be CST, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones *add* 2 hours in the PST zone; 4 hours in the MST zone; 3 hours in the CST zone, and 5 hours in the EST zone. *Add* 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 P.M. in Los Angeles; 17 or 5 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *standard* time in other areas of the USA *subtract* 8 hours in the PST zone; 7 hours in the MST zone; 6 hours in the CST zone and 5 hours in the EST zone. For example, at 20 GMT it is 15 or 3 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts c.w. or 300 watts p.e.p. on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts c.w. or 1 kw p.e.p. on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 db gain above these reference levels, the *propagation index* will increase by one level for each 10dB loss, it will lower by one level.

5. Propagation data contained in the Charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado, 80302.

System Electronic Technician

We seek a responsible and well organized candidate who can work with minimum supervision. Experience is required in the maintenance of communications transmitters and receivers. You must know digital and basic logic circuits, microprocessor and integrated circuits for troubleshooting and testing. FCC radio/telegraph 2nd class license mandatory.

This position is located in Southampton, Long Island.

Excellent salary and comprehensive package of liberal fringe benefits.

Call for appointment
M. Pulley (212) 797-3333

World Communications Via ITT

An Equal Opportunity Employer (M/F)

Please send all reader inquiries directly

GET THE BEST QUOTE FIRST– CALL BOB'S STORES

1-704-636-7959 or 1-305-592-2788

KENWOOD Transceivers/Accessories

TS-120S Xcvr	$ 699.95
VFO-120 remote VFO	159.95
ST-120, ext. speaker	39.00
AT-120 ant. tuner/SWR Mtr	99.95
TS-30 AC power supply, 13.8VDC, 20A	139.00
MB-100 mobile mt. bracket	29.00
YK-88CW 500 Hz CW filter	59.95
TS-180S Xcvr w. D.F.C.	1149.95
TS-180S w/o D.F.C.	984.95
TS-30 AC power supply, 13.8VDC, 20A	139.00
ST-180 ext. speaker w. selectable audio filters	69.95
DF-180 Dig.Freq.Control module	164.95
YK-88SSB IF Xtal SSB filter for dual filter system	59.95
YK-88CW 500 Hz CW filter	59.95
VFO-180 Remote VFO	179.95
AT-180 Ant. Tuner/SWR-RF Pwr Mtr/Ant. Sw	179.95

DRAKE® Transceivers/Accessories

TR-7 160-10m Transceiver	1200.00
DR-7 Digital/gen cov board	195.00
TR-7/DR-7 Xcvr w/dig, gen coverage	1395.00
PS-7 120/240V ac supply	249.00
MS-7 Speaker	36.00
RV-7 Remote VFO	195.00
FA-7 Fan for TR-7 or PS-7	25.00
NB-7 Noise blanker	90.00
SL-300 300 Hz crystal filter	52.00
SL-500 500 Hz crystal filter	52.00
SL-1800 1.8 KHz crystal filter	52.00
SL-6000 6 KHz crystal filter	52.00
MMK-7 Mobile mounting kit	49.95
MN-7 160-10m 250w matcher	165.00
MN-2700 160-10m 1Kw matcher	279.00
B-1000 4:1 balun	24.95
WH-7 160-6m wattmeter	89.00
7073 Hand microphone	19.00
7077 Desk microphone	45.00
Aux-7 Range program board	45.00
385-0004 TR-7 service manual	30.00
R-7 160-10m receiver	1100.00
DR-7 Digital readout/gen cov board	195.00
R-7/DR-7 Rcvr w/dig, gen coverage	1295.00
MS-7 Speaker	36.00
NB-7A Noise blanker	90.00
SL-300 300 Hz crystal filter	52.00
SL-500 500 Hz crystal filter	52.00
SL-1800 1.8 KHz crystal filter	52.00
SL-4000 4 KHz crystal filter	52.00
SL-6000 6 KHz crystal filter	52.00
Aux-7 Range program board	45.00
DL-300 300 w dry dummy load	19.95
DL-1000 1kw dry dummy load	39.95
DSR-2 10 KHz-30 MHz dig. receiver	3200.00
L-7 2Kw PEP 160-15m linear	1099.00
Optional crystals each	7.50
Fixed frequency crystals each	9.50
TV-42-LP 100w low-pass filter	14.60
TV-5200-LP 1Kw (100w/6m) low-pass	26.60
TV-3300-LP 1Kw 80-10m low-pass	26.60
TV-75-HP 75 ohm high-pass filter	13.25
TV-300-HP 300 ohm high-pass filter	10.60
1340 UV-3 2m FM Xcvr	595.00
1343 UV-3 2m/220 MHz FM Xcvr	795.00
1344 UV-3 2m/450 MHz FM Xcvr	795.00
1346 UV-3 2m/220/450 MHz FM	995.00
220 MHz add-on, factory installed	200.00
450 MHz add-on, factory installed	200.00
1504 PS-3 AC power supply	89.95
1330 UMK-3 Remote trunk kit	69.95
1339 Control head	90.00
385-0002 UV-3 service manual	25.00
1525EM Microphone w/touch tone	49.95

Prices subject to change without notice.

Bob Stocks All The Famous Brands Of Amateur Radio

• Ten-Tec • Kenwood • Drake • Swan • Icom • Alpha • Dentron • Kantronics • Wilson • Sprague • Bird • Telrex • Mosley • Mirage • Lunar • Alliance • Vibroplex • Shure • Telex • HyGain • Hustler • Taylor • B&W • Trac • Consolidated Towers

- We stock tubes and parts.
- Need more technical info before deciding which rig to buy? Call us!
- Got a service problem? We service what we sell.
- Got a trade-in? We'll take it in and give you a good price.

VISA master charge

Look For Our New Second Location Near The Miami Airport

BOB'S AMATEUR RADIO CENTERS

318 N. Main, Salisbury NC 28144 Hours: M-Sat 9am-7pm, Wed to 9pm Call 1-704-636-7959
7322 N.W. 46th St., Miami FL 33166 Hours: M-Sat. 9am-7pm Call 1-305-592-2788

CIRCLE 5 ON READER SERVICE CARD

HAM SHOP

FREE TO CQ SUBSCRIBERS

Advertising Rates: Non-commercial ads are 10 cents per word including abbreviations and addresses. Commercial and organization ads are 35 cents per word. Minimum charge $1.00. No ad (non-subscriber) will be printed unless accompanied by full remittance. Free to CQ subscribers (maximum 3 lines per month). Recent CQ mailing label must accompany ad.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Ham Shop have not been investigated, the Publisher of CQ cannot vouch for the merchandise listed therein. Direct all correspondence and ad copy to: CQ Ham Shop, 14 Vanderventer Ave., Port Washington, New York 11050.

LOOKING FOR old Lionel trains. Interested only in "O" Guage, excellent to like-new condition. Primary interest is locomotives prior to 1952, but will consider complete sets or more recent models. Am willing to buy outright for cash or swap radio gear to meet your needs. Write: Dick Cowan, c/o CQ Magazine, or call (516) 883-6200.

HAM KEY CHAIN. Handle, Call, QTH on lifetime plastic. $2.00. K4TIV, Box 1551, Johnson City, TN 37601.

BUY/SELL your used amateur gear. We match buyers with sellers nationwide. Send make, model, number, price, name, address, telephone. Fee $1.00 S.A.S.E. Write or phone Ham Buy & Sell Exchange. 3550 Lochinvar Ave., Santa Clara, Calif. 95051. 408-247-4220.

WANT: 1920's radios, horn spkrs & catalogs - SELL: Stoddard interference rcvr NM 30-A (20-300 MHz) $35 & Tektronix 105 squar wave gen. $20, W6THU, 1545 Raymond, Glendale, Calif. 91201.

KITS! ST5X terminal Unit/Power Supply/ AFSK. WRU. RTTY Scope Amplifier. Write for details: Bomark, Inc., Box 7116, Hollywood, Florida 33021, (305) 962-7219.

MAKE MONEY for yourself guaranteed send 25 cents and SASE to Danny Lee Ball, Box 624, Uneeda, W. Va. 25205.

NEW Hams, Shortwave, Scanner Listeners: Unique chart "Worldwide Listeners Guide to the Radio Spectrum". 0 to 30 GHZ. Find the QEII's frequency! 35" x 25" Full color. Guaranteed Satisfaction or Money Refunded. $4.50 Radio Publication, P.O. Box 28C, Lake Geneva, WI 53147.

WANT TO BUY OR RADE for anything electronic send 25 cents and SASE to Danny Lee Ball, Box 624, Uneeda, W. Va. 25205.

FREQUENCY ALLOCATION CHART. See how the entire radio spectrum is used. 2 kHz to 200 GHz. Send $3.00 to Collins Chart Co., Box 935, Coronado, CA 92118.

I HAVE THOUSANDS of electronic parts will sell cheap. Send 50 cents and SASE for full list to Danny Lee Ball, Box 624, Uneeda, W. Va. 25205.

WANTED: Hallicrafters S-1 thorugh S-7, H8PA, 5-T, SX-10, SX-12, and other early Hallicrafter gear, parts, and manuals-any condition-for private collection. Price and condition frist letter. C. Dachis, WD5EOG, 4500 Russell Drive, Austin, Texas 78745.

MOBILE IGNITION SHIELDING provides more range with no noise. Available most USA engines, some imports, Free literature. Bonding straps on sale now. Estes Engineering, 930 Marine Drive, Port Angeles, WA 98362.

WANTED: Original B & W photographs of unmodified amateur receivers by Barrett, Cardwell, Davco, DeForest, Galaxy, Guthman, Hatry & Young, Hendricks and Harvey, McCulla, National Pfanstiehl, Postal, Radio Constructors, Ross, Silver, Tobe, Wireless Egert; also marine receivers by Cardwell, Cutting and Washington, Heintz and Kaufman, Kilbourne and Clark, Simon Radio. Technical data also wanted for marine and rarer ham sets. H.L. Chadbourne, 530 Midway Street, La Jolla, CA 92037.

ATTENTION COUNTY HUNTERS! Keep tabs on your contacts. 38" x 25" map of all U.S. counties including major cities, $5.00 ea. MCL Sales, P.O. Box 300, Lombard, IL 60148.

FREE ELECTRONICS SURPLUS Catalog. Bargain Packed. Fascinating items, many never before advertised. ETCO-003, Box 762, Plattsburgh, NY 12901. Surplus Wanted.

WANTED: Pre-1925 wireless gear, books, magazines, spark transmitters and tubes. Jim Kreuzer, 1428 Main, Cirfu, NY 14036.

QSL CARDS: 500/$10. 400 illustrations. Free Catalogue. Bowman Printing, Dept. CQ, 743 Harvard, St. Louis, MO 63130.

WANTED: Old radio transcription discs; any size, speed. Larry, W7FIZ, Box 724, Redmond, WA. 98052.

TRAVEL-PAK QSL Kit - Converts Post Cards, Photos to QSLs. Stamp brings circular. Samco, Box 203, Wynantskill, N.Y. 12198.

WILL TRADE CIE Electronics Technology course with FCC license lessons for Heath Twoer or Sixer or best offer. Write first. Larry Hejduk, 208 W. Vandervoort, DeQueen, AR 71832.

LOUISIANA HAMFEST: November 11, 1979, West Monroe Civic Center, Prizes, fellowship and fun. AE5V for info.

UNBEATEN SIX BAND ANTENNA

THE JOYSTICK VFA (Variable Freq. Antenna) claims un-beaten scoring over commercial and/or conventional antennae.

- Simple, rapid erection
- Not only 6-band but CONTINUOUS 0.5 – 30 Mhz., incl. BC & MARS
- Omni-directional
- Substantially Harmonic FREE
- 1,000,000 miles per watt, unbeaten record!
- Poor QTH's enhanced!

CLIFF DWELLERS DREAM ANTENNA!

- QUOTE from CQ Mag. – "If you are high enough the antenna will operate (esp. at 15-20) as well as the well-known 3-element beam with which we compared it. The tests were 'operational, not theoretical'! We find that if we can hear 'em we can work 'em . . ."

SYSTEM 'A' $110.00
150 W.P.E.P. &/or Receiving only

SYSTEM 'J' $130.00
500 W.P.E.P. &/or Improved Q Factor Receive

Air mail cost included (Each system 3 sections easily assembled to make unit 7' 6" long. Matching ATU).

Rush Mastercharge/Visa no. or check or request FREE literature.

PARTRIDGE ELECTRONICS
G3CED LTD G3VFA
7, Partridge House,
Broadstairs, Kent, England.
Tel: 011 44 0843 62535

Please send all reader inquiries directly

New! Two full watts output!
Throw rocks on 40 or 80 for $25.95*

only **$25.95**

Kantronics Rockhound transmitter

Jump into QRP!

The **Kantronics Rockhound QRP transmitter** now generates a two-watt CW signal anywhere on 40 or 80 meters, depending on your model choice. With the right crystal and a little luck, Granite Falls, MI is just a stone's throw from Boulder, CO.

Slip the Rockhound into your pocket for mountain hikes or camping trips. It's only 3½" by 4" by 1½"! Our 8040-C receiver makes a lightweight companion. For power, just hook 12-15 Vdc in line with your key. A simple dipole puts your **Rockhound** on the air!

Start throwing today, our address is below.

** $29.90 with crystal. 7.125 or 3.725 MHz available.*

Please send all reader inquiries directly

KANTRONICS
The Lightweight Champs.

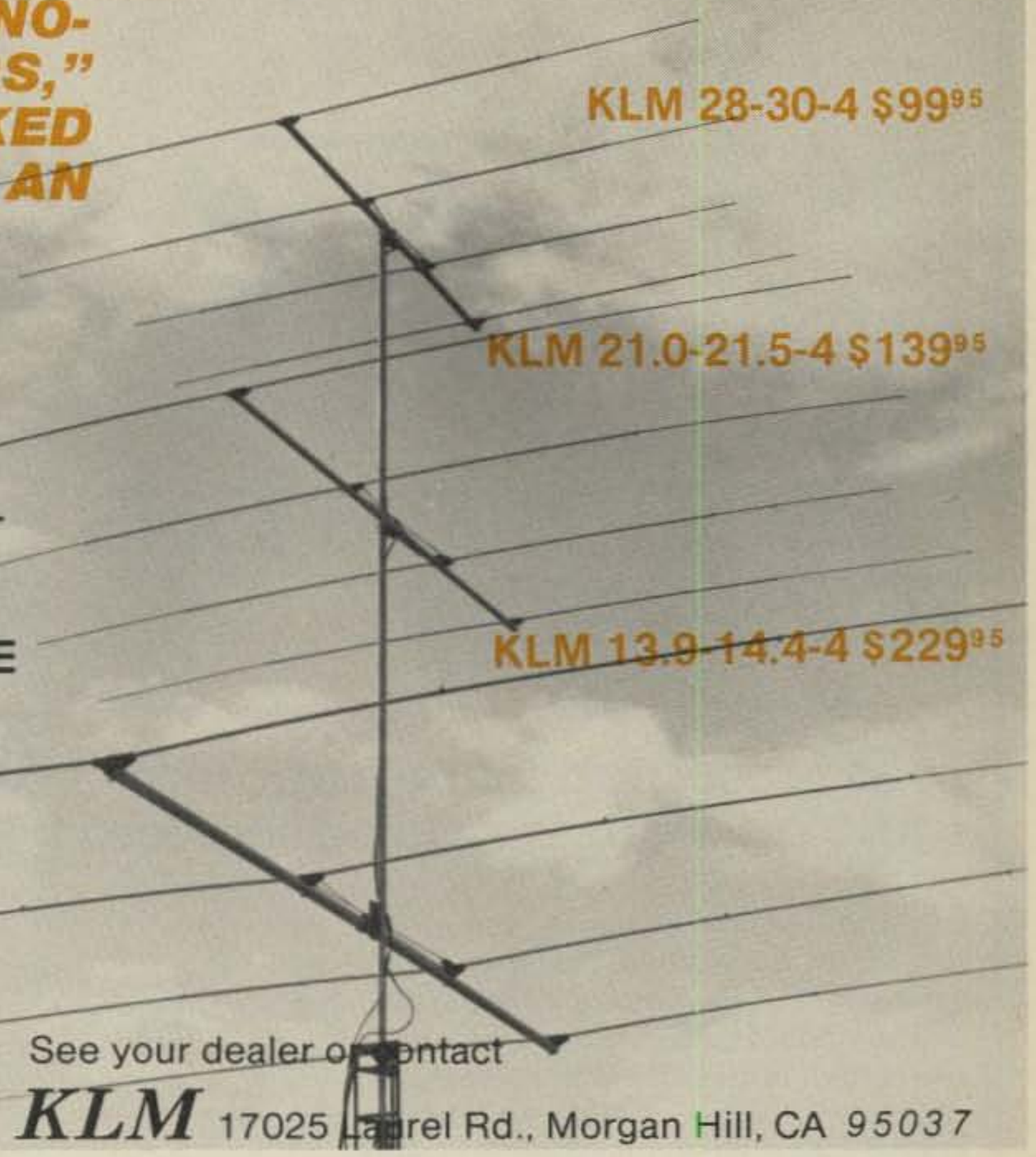
1202 East 23rd Street
Lawrence, Kansas 66044
We accept Visa, Master Charge, check and money orders.

Phone: 913-842-7745

STACKED IN YOUR FAVOR...

KLM's NEW 4 ELEMENT MONO-BANDERS, "THE 4-BANGERS," HAVE THE FEATURES YOU ASKED FOR – AND THEY DON'T COST AN ARM AND A LEG TO OWN.

- Simple speedy assembly
- One man installation
- Low windloading — perfect for lightduty towers and rotators
- Honest KLM 7.7 dbd (or better) Gain — less than 1.5:1 VSWR
- Dual-driven elements and KLM 4 KW P.E.P. Balun for FULL PERFORMANCE across the WHOLE BAND
- No tuning or matching
- Ideal for stacking a three band or monoband system
- The same hi-quality materials as KLM's world-famous "Big Stickers"



KLM's "4-BANGERS" – ready to help you make the most of Amateur Radio

See your dealer or contact

KLM 17025 Laurel Rd., Morgan Hill, CA 95037

CIRCLE 23 ON READER SERVICE CARD

190 pages, $6.95

ALL YOU NEED TO KNOW ABOUT AMATEUR ANTENNAS

"THIS BOOK IS FULL OF IDEAS FOR EVERY HAM"
Roy Neal, K6DUE

If this handbook isn't voted "most helpful" by newcomer and oldtimer alike, we'll be surprised. In clear language and 148 illustrations, it makes antennas easy and fun. Bill Orr, W6SAI, and Stu Cowan, W2LX, packed over 50 years of experience into this great new book.

Describes 75 Antennas that work

Vertical, horizontal and "sloper" wire antennas; Yagis, Quads, Quagi and LPY beams. Best DX locations & height; ground loss & radials; tower hazards & wind loading; why some antennas won't work & how to fix them -- and much more.

Save time & trouble -- get your copy

Our popular books are sold by leading dealers. Other helpful books: **Cubical Quads,** $4.75; **Beam Antennas,** $4.95; **Wire Antennas,** $4.95. On orders to publisher, please add 50¢ postage/handling, CT residents please add sales tax.

Radio Publications, Inc., Box 149, Wilton, CT 06897, USA

MORE MEMORY

THE MIMIC IAMBIC MEMORY KEYER GIVES YOU:

2 to 2½ times the memory of the others - 40 to 65 letters in each of four memories.

Fully Iambic. Dit & Dah paddle memories. Self completing characters, automatic spacing and weighting.

Speed adjustable from below 5 to well over 40 WPM.

Works on 115 VAC, 8-16 V AC or DC. All three supplies are built in.

Highest quality G-10 PC board with all new high quality reliable components.

Fully RFI protected. Solid state output keys Grid Block, Cathode keyed and the new transistorized rigs.

KIT VERSION Only $79.95
Please add $1.50 shipping.

Dual Tone sidetone monitor tells you when the memory is half full.

Memory section doesn't take off by itself when recording thanks to the fully triggered clock.

Messages can be recorded at one speed and played back at another.

About one third the size of the others—2.5 H, 4 W, 5½ D.

All plugs for the paddles and the transmitter supplied.

Comes with a 90 Day repair guarantee. Unit can be returned within 30 days for full refund (less shipping).

WIRED & TESTED UNIT Only $99.95—NYS residents add 7% sales tax.

Dealer Inquiries Welcome.

DTR DAYTRONICS COMPANY
12 Oakdale Ave., Box 426
Selden, New York, 11784

Please send all reader inquiries directly

THE PERSONAL COMMUNICATIONS FOUNDATION

Legal research for the amateur radio and citizens band services.

The Personal Communications Foundation is a non-profit, tax-exempt California corporation established in November, 1976. Its Board of Trustees, Officers and Advisors consist of lawyers, judges and law school professors with substantial experience in the representation of users who have encountered communications related legal problems.

The Foundation has been organized expressly for the purpose of creating a comprehensive personal communications law library. The Foundation continues to collect available court decisions, briefs and legal memoranda relating to personal communications.

The Foundation has already expended thousands of dollars in funding special studies. One study on the issue of Federal Pre-emption has already been incorporated into a brief before the California Court of Appeals.

Why you, the user, need the Personal Communications Foundation...

1 In 1976 there were over 7,000 legal matters involving all aspects of non-profit personal communications. In 1956 there were only 200.

2 *If you have an outdoor antenna*, you may be the subject of a criminal action for violating a zoning ordinance. If you are not now in violation of a zoning ordinance, be advised that they are being changed all over the country with the purpose of eliminating towers and outdoor antennas. You can be the subject of a civil action for violation of private deed restrictions.

3 *If you use a transmitter*, you may be sued if you interfere with a neighbor's TV or stereo, even if the interference is due to the inadequate designing of the TV or stereo.

4 Litigation of this nature can cost $10,000 or more. It is estimated that 40% of that amount represents time expended in research. By providing your attorney with our research material, the Personal Communications Foundation can save you thousands of dollars in addition to helping your attorney better represent you.

...and why the Personal Communications Foundation needs you.

The Personal Communications Foundation is a membership corporation. Four classes of membership have been established, known as Associate Membership, for a yearly contribution of $10.00, Full Membership, for a yearly contribution of $25.00, Contributing Membership, for a yearly contribution of $100.00, and Life Sustaining Membership, for a single contribution of $250.00 or more. All contributions are completely tax deductible. All members of the Foundation will receive the newsletter.

NAME (first, middle initial, last) or COMPANY NAME

CQ

STREET ADDRESS

CITY STATE ZIP

PCF use only

MEMBERSHIP CLASS (check one)

- ☐ LIFE MEMBER ($250)
- ☐ CONTRIBUTING MEMBER ($100)
- ☐ FULL MEMBER ($25)
- ☐ ASSOCIATE MEMBER ($10)

AMOUNT ENCLOSED

DATE

SIGNATURE

SEND CHECK PAYABLE TO:

PERSONAL COMMUNICATIONS FOUNDATION
10960 Wilshire Boulevard, Suite 1504
Los Angeles, California 90024

FOR SALE: Shortwave rec. and freq. standard kits, built. $25, KA9CIM, 204 Sequoia Dr., Glen Ellyn, IL 60137.

FREE: Fundamentals of Light Propagation, masses with C - plus relative celocities, superior, trajectory relativity & unified field theory, Einstein's eclipse scandal, obsolete, elastic solid aether - based relativity scandals, exposed, reformed! Write W.T. Thomas, Jr., 408 Vermont, Daytona, 32018.

VP5 PROVIDENCIALES. Your fam. won't mind your DXing. They will also have the time of their lives with swimming, snorkeling, fishing, beachcombing, etc. Our new home is completely furnished, including transceiver and antenna. Refere to June '77 issue of CQ. Info. Rene Weber, 2600 Douglas Road, Suite 1100, Coral Gables, FL 33134.

WANTED: Hallicrafter S-1 through S-7, DD-1, 8HPA, SX-10, SX-12, and other early Hallicrafter gear, parts, manuals & accessories. Any condition, for my collection, please write even if in doubt on model number. Chuck Dachis, WD5EOG, 4500 Russell Drive, Austin, Texas 78745.

NORTH AMERICAN DX Report - free sample - SASE to Suites R2-R3, 615 S. Frederick Ave., Gaithersburg, MD 20760 - phone, (301) 840-1987.

SELL: HT-37, $99, HQ-170, $60, Hamm, $40, Precision RF Gen., $25, Heath RF Gen., $10, Simpson 260, $25, HBGG813's/PS, $50. All $220. No ship. Norwich, CT (203) 887-0572.

FIBERGLASS VAULTING POLES. Perfect quad spreaders or VHF/UHF booms. S.a.s.e. for info. K5WSE, Box 1032C, Cedar Park, TX 78613. (512) 259-2164.

SCANNER/MONITOR accessories, kits and factory assembled. Free catalog. Capri Electronics, Route 1A, Canon, GA 30520.

UHF/VHF Power Transistor plus Micro "T", 5000 MHz transistors. Send SASE for complete list of my collection. All new devices. WA6PNX/1, P.O. Box 680, Rainier, Oregon 97048.

JUKEBOX WANTED: Wurlitzer 78 RPM any condition. I also need parts, especially Amplifiers or Speakers. Literature or service manuals on any Jukebox also needed. Rick Botts, Box 1081, Des Moines, Iowa 50311.

ANTENNA TRIPOD — Install Tubular masts single handed in vertical position 34/95 up. Details SASE to Antenna, 5316 Fairfax St., Shreveport, LA 71108.

WANTED: Hallicrafters SX-42 receiver in working condition. Contact: Rev. Tom Trimmer, 3532 W. Monroe Road, Alma, MI 48801.

HEATHKIT HW-101 Transcvr.; matching power supply, speaker, mic. 75 percent completed. You pickup. $395.00. E. Schwartz, 4277 Motor Ave., Culver City, Cal. 90230.

QSLs with Class! Unbeatable quality, reasonable price. Samples: 50 cents, refundable. QSLs Unlimited, 1472 SW 13th St., Boca Raton, FL 33432.

"Hall Effect dc current monitors. The latest in integrated circuit and magnetic technology. Voltage isolated method to detect presence or absence of dc currents or to sense overlad currents. Protect your diodes, transistors and PC boards. Outputs compatible with TTL, CMOS or can drive relays. Available current ratings 1 to 10 amperes. Tolerance +10 percent. Size 1.25 x 0.4 x 0.5 inches. Ready to mount on you PC board. Specify curfent required and send $9.95 to Energy Science, P.O. Box 152, Goleta, CA 93017.

QSLFILE is the ONLY way to protect and display your QSLs. Working on DXCC or 5BWAS? QSLFILE shows the countries/states you still need, too. For details, write: QSLFILE, 1472 SW 13th St., Boca Raton, FL 33432.

SAROC — January 10-13, 1980 at Dunes Hotel and Country Club. Las Vegas, NV. Exhibits, Technical sessions. Advance Registration $15.00 per person, your check is your receipt, the number we place on your check is you SAROC registration number. We will make refunds to those who request same in writing and is postmarked before January 10. SAROC special room rate is $33.00 plus room tax per night, single or double occupancy. Dunes Hotel accomodations request will be sent to SAROC registered delegates. SAROC, P.O. Box 945, Boulder City, NV 89005.

FOR SALE: Complete set of Time-Life camera books, 17 volumes plus master index and Photographers Handbook, $125. A. Dorhoffer, K2EEK, CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

QSL — QSL — QSL: Please send QSL Cards to: Philip Steven Kurland, P.O. Box 1686, New Haven, CT 06507.

FOR SALE: Old issues of Ham Radio, 73, CQ, QST. Some complete runs. Send s.a.s.e. for lists and prices. A. Dorhoffer, K2EEK, CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

WANTED: Extra coils for SW-3 receiver. I have odd-ball coils and need your single extras to make up complete set. Buy or trade. Bill Orr, W6SAI, Eimac, 301 Industrial Way, San Carlos, CA 94070.

SALE: Sony ICF-5900W multi-band receiver designed for SWLs. Like new condition w/ manuals, $100. Schultz, W4FA, Box "L", FPO, NY 09544.

FOR SALE: Tektronix 535 oscilloscope with dual trace and fast rise-time plug-ins. Very good condition, $425. Prefer local pick-up. Irwin Schwartz, K2VG, c/o CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

WANTED: Pre-war issues or Short Wave Craft magazine. Bill Orr, W6SAI, Eimac, 301 Industrial Way, San Carlos, CA 94070.

WANTED: Collins 51-R receiver (VHF). Bill Orr, W6SAI, Eimac, 301 Inudstrial Way, San Carlos, CA 94070.

WANTED: Antique Glass-looking for old milkglass-purple, slag, carmel, and greentown. Tell me what you have. I pay the highest prices. Write: Jack Schneider, c/o Cowan Publishing Corp., 14 Vanderventer Ave., Port Washington, NY 11050.

SALE: Heath IM-28 VTVM kit. New, perfect. Ordered by mistake. $40. Schultz, Box "L", FPO NY 09544.

MEDICAL: Any licensed amateur radio operator in the medical or paramedical field should join MARCO (Medical Radio Council). Contact: Stan Carp, M.D., K1EEG, 44 Main St., Saugus, MA 01906. (617) 233-1234.

CQ AND QST 1950-1975 ISSUES FOR SALE. Send SASE if ordering 73, Ham Radio, or other CQ and QST issues. One dollar minimum order and all issues cost 25 cents each, including USA shipping. Send chronological list and full payment to W6LS, 2814 Empire Ave., Burbank, CA 91504. Available issues and refund sent within one month.

CERTIFICATE FOR Proven Two-Way Radio Contacts with Amateurs in all ten (10) USA call areas. Award suitable to frame and proven achievements added on request. SASE brings TAD data sheet from W6LS, 2814 Empire Ave., Burbank, CA 91504.

SCANNER OWNERS! It's here! The "Top Secret" Registry of U.S. Government radio frequencies 25 to 470 MHz, by K2AES. First and only book of its kind ever published! Lists 2,250+ freqs. of Military, FBI, Treasury, FCC, Border Patrol, Customs, Secret Service, NASA, FAA, CIA, Federal Prisons, U.S. Marshals, Satellites, National Park Service, Fish/Wildlife, and much more! Only $4.95 postpaid (USA, APO, FPO orders only, please); from CRB Research, P.O. Box 56-CQ, Commack, NY 11725.

target your signal with a CDE rotor

The AR22XL and AR40 - just two of six rotors from CDE to professionally target your signal for better communications...exclusive features like all steel gear systems, motor rated at 350 in lbs. stall torque plus famous CDE rotor performance.

ON TARGET KIT

Send for your EMBROIDERED PATCH, WALL CERTIFICATE, TIME ZONE GUIDE, Plus details on the CDE Rotor to match your antenna. Enclose $1 for handling and mailing costs. Send to:

CDE CORNELL-DUBILIER
CORNELL-DUBILIER ELECTRIC CORPORATION
Box 162, Essex Fells, New Jersey 07021

361

I'm On Target—Send Kit To: 22/40

Name

Address

City

State Zip

☐ Enclosed $1. for kit handling & mailing.
or
☐ Send free details on all CDE rotors.

Please send all reader inquiries directly

The time has come for all amateurs to unite on sight. We must know each other as do other fraternal organizations. The ability to recognize each other on any occasion is a true mark of fraternal brotherhood. Group III, (WB2LCK, KB2DX and KB2DZ) designed this 10 karat gold ring to portray our great and proud fraternity. This exquisite ring is made exclusively for you by Josten's (world famous for their quality achievement rings) with your call letters prominently displayed. For detailed information and reusable ring sizer...Write:

Group III Sales Co.
Dept. 3519 P.O. Box 259
Little Neck, N.Y. 11362

No Obligation

CIRCLE 20 ON READER SERVICE CARD

GET ORGANIZED!

Here's a set of 4 sturdy files that holds over 4 years of your favorite 8½ × 11 magazines.

4 MAG FILES $4.95

Send $4.95 plus $1.00 for postage and handling to:

DGM INDUSTRIES
P.O. BOX 388-H
DOVER, N.H. 03820

Please send all reader inquiries directly

NORTH GEORGIA'S ONLY AUTHORIZED YAESU DEALER

Britt's 2-Way Radio Sales & Service

ADVANCED AMATEUR RADIO EQUIPMENT

YAESU

DAN C. BRITT
432-8006

2508 Atlanta St.
Belmont Hills Shopping Center
Smyrna, GA. 30080

CIRCLE 6 ON READER SERVICE CARD

MILITARY SURPLUS WANTED

Space buys more and pays more. Highest prices ever on U.S. Military surplus, especially on Collins equipment or parts. We pay freight. Call collect **now** for our high offer. 201 440-8787.

SPACE ELECTRONICS CO.
div. of Military Electronics Corp.
35 Ruta Court, S. Hackensack, N.J. 07606

CIRCLE 25 ON READER SERVICE CARD

HOT DX INFO!!! World's Best Known* WEEKLY DX BULLETIN

Calls—Frequencies—Propagation—QSL Info for those Rare and Exotic countries

SEND Business size SASE for sample copy TO: **THE DX BULLETIN**
306 Vernon Ave., Vernon, CT 06066
*(Formerly—The West Coast DX Bulletin).

Please send all reader inquiries directly

AdOphObiA

Do you have an abnormal fear of classified ads? Afraid that what you saw isn't available anymore or that no one will ever buy your complete set of Walter Ashe Catalogs? Does that make you tense?

Loosen up and lift your horizons, reach out to the world, help is on the way. In a few short weeks you will receive mail that will answer all of the above questions and perhaps contain coin of the realm. Quickly turn to page 90 for the prescription to rid yourself of the adophobic blues.

ALL BAND TRAP ANTENNAS!

PRETUNED - COMPLETELY ASSEMBLED - ONLY ONE NEAT SMALL ANTENNA FOR UP TO 6 BANDS! EXCELLENT FOR CONGESTED HOUSING AREAS - APARTMENTS LIGHT - STRONG - ALMOST INVISIBLE!

FOR ALL MAKES & MODELS OF AMATEUR TRANSCEIVERS - TRANSMITTERS - GUARANTEED FOR 2000 WATTS SSB 1000 WATTS CW. INPUT FOR NOVICE AND ALL CLASS AMATEURS!

COMPLETE AS SHOWN with 90 ft. RG58U-52 ohm feedline, and PL259 connector, insulators, 30 ft. 300 lb. test dacron end supports, center connector with built in lighning arrester and static discharge - molded, sealed, weatherproof, resonant traps 1"X6"- you just switch to band desired for excellent worldwide operation - transmitting and recieving! WT. LESS THAN 5 LBS.

160-80-40-20-15-10 bands 2 trap--209 ft. with 90 ft. RG58U - connector - Model 777BU . . . $64.95
80-40-20-15-10 bands 2 trap --- 102 ft. with 90 ft. RG58U - connector - Model 998BU . . . $59.95
40-20-15-10 bands 2 trap --- 54 ft. with 90 ft. RG58U coax - connector - Model 1001BU . . . $58.95
20-15-10 bands 2 trap --- 26 ft. with 90 ft. RG58U coax - connector - Model 1007BU $57.95

SEND FULL PRICE FOR POST PAID INSURED DEL. IN USA. (Canada is $5.00 extra for postage - clerical - customs - etc.) or order using VISA Bank Americard - MASTER CHARGE - AMER. EXPRESS. Give number and ex. date. Ph 1-308-236-5333 9AM - 6PM week days. We ship in 2-3 days. ALL PRICES WILL INCREASE MAR 1-SAVE - ORDER NOW! All antennas guaranteed for 1 year. 10 day Money back trial! Made in USA. FREE INFO. AVAILABIE ONLY FROM.

WESTERN ELECTRONICS Dept. AC- 11 Kearney, Nebraska, 68847

CIRCLE 39 ON READER SERVICE CARD

WANTED - DC Pwr. Supply for Tempo One. Prefer one in good shape. WD0AFQ, Phone - 314-624-5163.

FOR SALE: BC-610E xmitter works well, $200.00 your pick up. K9BSL, 122 Country Club Dr., La Porte, IN 46350.

ESTATE SALE, 1916 to date radio equip. Plse send SASE for six page listing. W6IRK, 625 Tufts, Burbank, CA 91504.

WANTED: Globe King 500 Bor C, Gonset 3018, NC57, B&W 5100B, L1000A, 51SB-Bor 4, PT. J. Schwerbel, RD1 Box 215, Catskill, N.Y. 12414.

DXERS! Ham sentences in 54 languages on our outgoing DX QSLs get results! K3CHP's DX QSL Guide, $3.95. Joe Mikuckis, 6913 Furman Pkwy., Riverdale, MD 20840.

SEND SASE for list 4-1000 Amplifier parts, tubes, xfmrs, Pwr. Supplies etc., Basham, 735 Caves Hwy., Cave Junction, OR 97523.

RTTY MODULATOR PC BOARD. See Feb. '79 Ham Radio. Drilled $5.00. F.E. Hinkle, 12412 Mossy Bark, Austin, TX 78750.

CROSLEY ANTIQUE RADIO, Model 9-103. Good condition, original knobs, $35.00 Postpaid. H. Anderson, 816 N. Cedar St., Colo. Springs, CO 80903.

MACKAY-RADIO old commercial headphones, $25.00 Postpaid. H. Anderson, 816 No. Cedar St., Colo. Springs, CO 80903.

HEATH Mohawk Rcvr. $60, VHF Eng. HB-144B $70, I ship. Bob Staunton, 812 W. Spring St., Kingston, TN 37763.

DRAKE: C-4 Console $325. Dentron SST 3KW tuner $165. MT-3000A $265. Clem Duval, W8VO, 313-268-2467.

SSTV AND PHOTOGRAPHERS - Make offer 1 each, like new, Fujitar lenses - 135 mm, f 4.5-telephoto, 35 mm, f 3.5-wide angle. Cary Cowan, c/o CQ Magazine, or call (516) 883-6200.

The book "CQ YL" has been updated again with a new supplement bringing the YLRL Officers section up to date through 1977, plus a report on the 7th International YLRL Convention held in Houston in June 1976. If you have a copy of "CQ YL" and would like to add the new supplement (the pages are "slotted" so they can be inserted directly into the book's spiral backbone), drop a note with your request to author/publisher W5RZJ, Louisa Sando, 9412 Rio Grande Blvd., NW, Albuquerque, NM 87114. Please enclose $1 to cover cost of printing and mailing. The one and only book about YLs in ham radio, "CQ YL" contains 23 chapters, over 600 photographs. Order your autographed copy, or a gift copy, from W5RZJ, $3.50, postpaid.

SELL: Knight VFO with 10, 11, 15, 20, 40 & 80 meters. In good condition. $30.00. Long Island, N.Y., Seth, 516-371-0487.

NCX-1000 $695. 7551 (CWF), 32S1, 516F2 $975. NCX-3, ACPS $235. C.E. 100V $200. "Apache" $85. ML-2 $125. IC-230 $229. 75A3 $195. James Craig, Box 615, Portsmouth, NH 03801.

NEWTRONICS HF62 6&2 Mtr. Center loaded antenna whip $5.00, Antenna Specialties M-103 AM/CB Mobile Antenna $8.00. Lambda 300VDC regulated Pwr. Supply $30. Mosley Lancer 1000 10-75 Mtr. Mobile antenna with mast $50.00, Gonset noise limiter for mobile use $8.95. Central Electronics Compression Amplifier $20.00 All prices FOB. Will Ship. T. K. Brown, RD1 Box 102, Forksville, PA 18616.

SELL: Kenwood TR 7400A 2-m transceiver, new, $350. Drake TR-4C transceiver, AC-4 pwr. supply, MS-4 spkr/cab, mint, $495. Incl. shipping USP. Write DS, Box 48, Ballardvale, MS 01810.

FOR SALE: HR 212 Full of Xtals $130. Ted Long, K0UQV, Rte. 2 Box 166, Nevada, MO 64772. 417-667-5716.

WANTED: Tuner and Watt/SWR Meter Inexpensive and good condx. Pete, WD2AEG, 9 Gessner Terrace, Pomona, N.Y. 10970.

QUAD BUILDERS. Up to 16 feet long. 1+ tapered to 5/8. Send SASE for quote. WB7OTR, P.O.B. 209 Roseburg, OR 97470.

SELL: Collins KWM-2 (wing) witn (wound) power supply. M-2 has Waters rejection tuning. Recently calibrated and in excellent condition, $900. Norm, 15 Dera St., Greenville, SC 29615, 1-803-242-0473.

EUROPEAN MULTIBAND PORTABLES. Grundig. Satellit 2100. $580. Satellit 3000. $1000. Nordmende. Globetrotter 808. $600. Factory fresh. Squires, Box 113, Maxatawny, PA 19538.

WANTED: Early Wireless, Radios, tubes, literature, parts. Troe, Skyline Dr., Morristown, N.J., 07960.

FOR SALE: TRS-80 Level II, 16K, Radio Shack Computer, $850.00, or best offer. Write: N8AOV, 6401 N. US 23, Oscoda, MI 48750.

FOR SALE: Tempo 2020 $600.00, VIZ WR 50c RF Generator (new, never used) $100.00, NPC 12 amp regulated power supply $65.00. Gary Castellini, 3567 S. Lincoln Ave., Vineland, N.J. 08360.

FOR SALE: Tempo 1, Ext. VFO. AC P/S (Black Face) Swan 1200X Linear all mint. Make offer or trade. K. Elliott, 515-873-4126 Allerton, IA 50008.

NO - 91 - 92

ADVERTISER'S INDEX

To speed information to you on products shown in CQ advertising, a new computerized Reader Service System has been designed. For additional information on a particular ad in this issue, tear out the Reader Service postcard bound in this issue and circle the numbers on the card which correspond with the Reader Service numbers listed on the INDIVIDUAL ADS. DON'T CIRCLE THE PAGE NUMBERS! Fill in your name and address, and mail. We'll have your information on the way in short order.

AGL Electronics 70
Barker & Williamson 44
Barry Electronics 85
Bencher, Inc. 65
Bob's Amateur Radio Center 89
Britt's 2-Way Radio 94
Butternut Electronics 81
CeCo Communications, Inc. 65
Collins, Div. of Rockwell Int'l 7
Comm Center Distributors, Inc. 64
Command Productions 44
Continental Specialties 8
Cornell Dubilier 93
DGM Industries 94
DSI Instruments 20
The DX Bulletin 94
Daytronics 91
DenTron Radio 12, 19
Digitrex Electronics Co. 82
Eagle Electronics 58
Eimac, Div. of Varian . . . . . Cov. IV
Electronic Research Corp. 32
Flesher Corp. 42
Fox-Tango 80
G.I.S.M.O. 36
Gregory Electronics 70
Group III 94
HAL Communications 33
Hal-tronix 79
Ham Radio Outlet 2
Heath Company 11
Henry Radio 21
ICOM . . . . . Cov. II
IRL 79
ITT 86
International Crystal Mfg. Co. 47
KLM 6, 91
Kantronics 90
Kengore Corp. 58
Kenwood 48, 49
MFJ Enterprises 1, 83
Madison Electronics 64, 70, 79, 80
Magnus 43
Micro Filter 76
Mor-Gain 57
NRI 23
Palomar Engineers 95
Partridge Electronics 90
Space Electronics 94
Swan Electronics 50
TET USA 45
Telrex Laboratories 82
Ten-Tec 5
Unarco-Rohn 72
Western Electronics 94
Wilson Electronics 25
Wilson Systems 14, 15, 16, 17, 18
Yaesu Electronics . . . . . 96, Cov. III

VLF Converter

- **New device opens up the world of Very Low Frequency radio.**
- **Gives reception of the 1750 meter band at 160-190 KHz where transmitters of one watt power can be operated without FCC license.**
- **Also covers the navigation radiobeacon band, standard frequency broadcasts, ship-to-shore communications, and the European low frequency broadcast band.**

The converter moves all these signals to the 80 meter amateur band where they can be tuned in on an ordinary shortwave receiver.

The converter is simple to use and has no tuning adjustments. Tuning of VLF singles is done entirely by the receiver which picks up 10 KHz signals at 3510 KHz, 100 KHz signals at 3600 KHz, 500 KHz signals at 4000 KHz.

The VLF converter has crystal control for accurate frequency conversion, a low noise rf amplifier for high sensitivity, and a multipole filter to cut broadcast and 80 meter interference.

All this performance is packed into a small 3'' x 1½'' x 6'' die cast aluminim case with UHF (SO-239) connectors.

The unique Palomar Engineers circuit eliminates the complex bandswitching and tuning adjustments usually found in VLF converters. Free descriptive brochure sent on request.

To order, send $55.00 plus $3.00 shipping/handling. Calif. residents add sales tax.

master charge THE INTERBANK CARD

VISA

Explore the interesting world of VLF. Order your converter today! Send check or money order to:

Palomar Engineers

Box 455, Escondido, CA. 92025 • Phone: [714] 747-3343

Please send all reader inquiries directly

"THE INFLATION FIGHTER"

Top Performance For The Budget-Minded Amateur

Analog Model FT-101Z

If economy is an important consideration, and you don't need the frequency counter and digital display, then choose the FT-101Z. The precision VFO gear mechanism is coupled to an easy-to-read analog display, providing resolution to greater than 1 kHz. All other features—the variable IF bandwidth, RF speech processor, superb noise blanker, VOX—are identical to the FT-101ZD. Yaesu gives you greater choice, so that you don't have to pay for what you don't need! The counter and digital display can be added to your FT-101Z at a later date, if you wish.

Specifications : FT-101Z

GENERAL

Frequency coverage: Amateur bands from 1.8–29.9 MHz + WWV/JJY (receive)
Emission types: LSB, USB, CW
Power requirements: AC 100/110/117/200/220/234 volts, 50/60 Hz, DC 13.5 volts, negative ground (with optional DC–DC converter installed)
Power consumption: AC 85 VA receive (73 VA HEATER OFF) 330 VA transmit, DC 5.5 amps receive (1.1 amps HEATER OFF) 21 amps transmit
Case size: 345(W) x 157(H) x 326(D) mm
Weight: Approx. 15 kg.

RECEIVER

Sensitivity: 0.25 μV for S/N 10 dB
Selectivity: SSB 2.4 kHz at –6 dB, 4.0 kHz at –60 dB. CW (with optional CW filter: 600 Hz at –6 dB, 1.2 kHz at –60 dB)
Image rejection: Better than 60 dB (160–15 m), better than 50 dB (40 m)
IF Bandwidth: Continuously variable from 2.4 kHz to 300 Hz, using two 8-pole IF filters
Audio output: 3 watts at 10% THD into 4 ohms.

TRANSMITTER

Power input: 180 watts DC
Carrier suppression: Better than 40 dB
Unwanted sideband suppression: Better than 40 dB (14 MHz, 1 kHz modulation)
Other spurious radiation: Better than 40 dB down
Third order distortion products: Better than 31 dB down
Transmitter frequency response: 300 – 2700 Hz (–6 dB)
Antenna output impedance: 50–75 ohms, unbalanced.
Microphone input impedance: 500–600 ohms (low impedance)
Note: FT-101Z (analog) cannot be used with the FV-901DM, as there is no frequency display.

Price And Specifications Subject To Change Without Notice Or Obligation

CIRCLE 61 ON READER SERVICE CARD

YAESU
The radio.

YAESU ELECTRONICS CORP., 15954 Downey Ave., Paramount, CA 90723 ● (213) 633-4007
YAESU ELECTRONICS Eastern Service Ctr., 9812 Princeton-Glendale Rd., Cincinnati, OH 45246

A Breakthrough In Technology!

THE YAESU FT-207R

MICROPROCESSOR CONTROLLED SYNTHESIZED HANDIE

The Yaesu FT-207R Synthesized Handie has all the features you could want in a very compact package

- 144-148 MHz Range
- 10 KHz Steps
- 3 Watts Output
- 4 Memories plus Programmable Offset
- Priority Channel
- Memory and Band Auto Scan
- Optional Equipment:

  Tone Squelch, Speaker/Mike, Nicads, Battery Charger

- Keyboard Encoded Frequency Entry
- 2 Tone (Touchtone®) Input from Keyboard
- Keyboard Lock guards against accidental frequency change
- Odd Splits Can Be Programmed from Keyboard
- Automatic Battery Saver Feature for LED Display
- Rubber Flex Antenna

arma

CIRCLE 48 ON READER SERVICE CARD

YAESU

The radio.

Price And Specifications Subject To Change Without Notice Or Obligation

679X

YAESU ELECTRONICS CORP., 15954 Downey Ave., Paramount, CA 90723 ● (213) 633-4007
YAESU ELECTRONICS Eastern Service Ctr., 9812 Princeton-Glendale Rd., Cincinnati OH 45246

Heathkit SB-221 linear amplifier uses EIMAC 3-500Zs for efficiency, economy and performance.

Designed for rugged service.

The new desktop Heathkit SB-221 linear amplifier provides up to 2000 watts PEP input for SSB and 1000 watts input for CW service. Only 100 watts drive power is required to achieve these power levels.

Designed for rugged contest and traffic service, the SB-221 uses the highest grade components including two EIMAC 3-500Z high gain power triodes, well-known for their reliable, efficient performance. One thousand watts of plate dissipation is available from the two tubes, providing ample safety factor for long life service.

The designer's choice.

Top-notch equipment designers, such as Heathkit, choose EIMAC power tubes for commercial as well as amateur products. The 3-500Z power tube used in the SB-221 also serves in many commercial broadcast, FM and point-to-point radio systems where reliability and long life are paramount.

varian

Make sure this fine EIMAC 3-500Z is in your equipment. For full details and a data sheet on the 3-500Z, write Varian, EIMAC Division, 301 Industrial Way, San Carlos, CA 94070. Or contact any of the more than 30 Varian Electron Device Group Sales Offices throughout the world.

CIRCLE 22 ON READER SERVICE CARD